

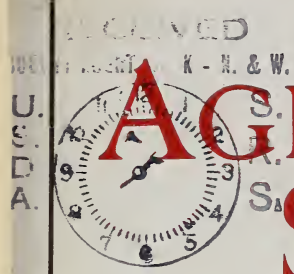
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THE AGRICULTURAL STUDENT

MAR 23 1919 OHIO STATE UNIVERSITY, COLUMBUS, OHIO



MARCH, 1919

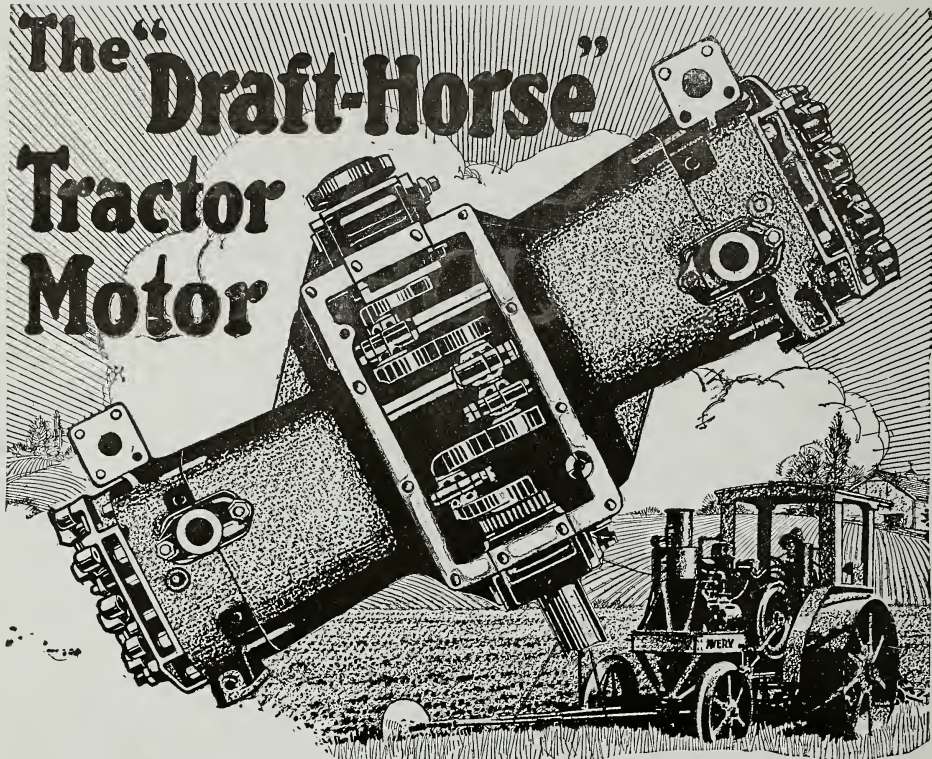
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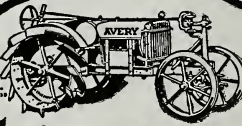
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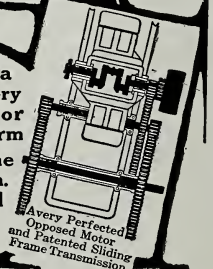
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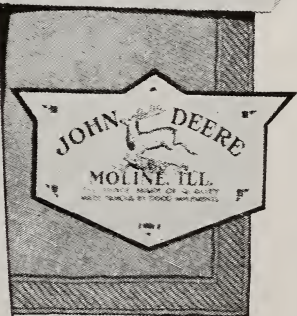
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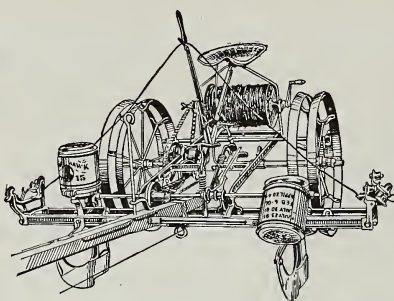
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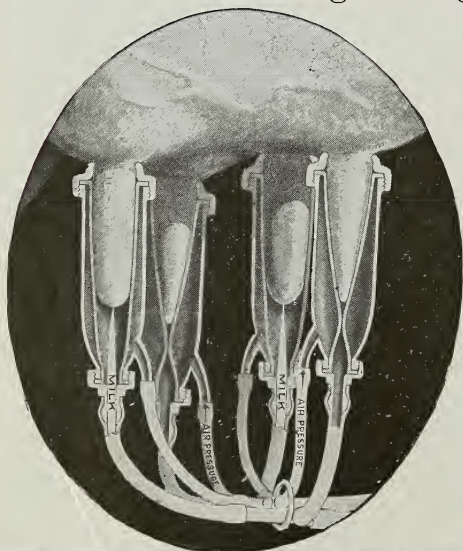
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OBSERVATORY—OHIO STATE UNIVERSITY

The Agricultural Student

VOL. XXV.

OHIO STATE UNIVERSITY, COLUMBUS, OHIO, MARCH, 1919

No. 7

WHY USE NITROGENOUS FERTILIZERS?

By FIRMAN E. BEAR

(Professor Bear has charge of the soils work at Ohio State University. In this article, he tells how the nitrogen content of the soil can be increased without the use of nitrogenous fertilizers.)

THE average soil contains thirty-five hundred pounds of nitrogen per acre to plow depth. Smaller amounts are to be found in the subsoil. A one hundred bushel corn crop (the kind we hope to grow) removes one hundred and fifty pounds of this nitrogen from the soil and stores it in the stalk and grain. Corresponding yields of oats and wheat require approximately one hundred pounds of nitrogen each while a three ton timothy crop is satisfied with fifty pounds of this element.

Evidently, if no outside source of nitrogen was available, the soil would be rapidly depleted of this element because of the amounts removed and sold from the farm either in the form of grain, livestock or livestock products. The loss is not confined, however, to that which is utilized by plants but is augmented by that carried away in the drainage.

On the other hand, the air over this acre of soil contains some thirty-five thousand tons of this element nitrogen which is made available thru the activities of certain groups of organisms which are present in all normal soils. There has been a tendency on the part of some of those who deal in nitrogenous fertilizers to minimize the importance of these organisms. The longer we study this problem the more we are convinced that their value is underesti-

mated even by most agronomists who have nothing to gain by so doing.

From a systematic study of the experimental evidence on this subject the writer has concluded that the matter is much more definitely known than many statements would have us believe. True, the amount of nitrogen so secured depends on a number of factors which are well recognized by all students of this problem. But, on the whole, the evidence is such as to leave little room for doubt concerning the efficiency of these organisms.

From the evidence available the accompanying table has been arranged which gives some idea of the nitrogen income and outgo on a well regulated farm.

NITROGEN BALANCE IN LIVESTOCK FARMING

Rotation—Corn, Soybeans, Wheat, Clover.

Pounds per Acre	
Income and Outgo	Per Annum
1. In drainage.....	15 to 25
2. In rainfall	3 to 5
3. In manure	51
4. Non-symbiotic fixation.....	50 to 60
5. Removed from air by clover.....	11
6. Secured from air by clover.....	11
7. Secured from air by soybeans.....	10
Maximum nitrogen income $2+3+4+6+7=$	
137 lbs.	
Maximum nitrogen outgo $1+5=$	
101 lbs.	

Data for item 1 is found in the experiments at Rothamsted and at Cornell. Nitrogen in rainfall has been de-

terminated at Rothamsted and in Mississippi, Kansas and Utah in this country. The amount of nitrogen shown in the other five items is dependent on the rotation followed by the extent to which acid phosphate and limestone are applied, and the use which is made of the crops grown.

For the purpose of this statement it seems desirable to select the rotation of corn, soybeans, wheat and clover since very definite information is available concerning the manure production with this rotation when all the crops are fed with the exception of the wheat grain. In his "Livestock vs. Grain Farming" experiment at Wooster, Williams has shown that fifty-one pounds of nitrogen per acre can be returned to the soil every year by growing these crops in rotation and returning the manure. Analyses of the crops removed indicate that seventy-six pounds of nitrogen per year is contained in the yearly acre produce.

It is necessary from this point to make some estimation of the quantity of nitrogen which is secured from the air by growing the two legumes included in the rotation. From a study of the crop yields of plot eight in the five-year rotation at Wooster it would appear that in twenty-five years time the crops grown and removed from this plot had taken with them eleven hundred pounds of nitrogen per acre. No nitrogen was supplied in fertilizer or manure. The crop yields on the whole cannot be said to be on the decline. Clover is the only crop which shows this tendency which is explained by the prevalence of clover anthracnose. It seems reasonable to believe that at least this much nitrogen together with that in the drainage water has been secured from the air.

The matter of distributing this gain

between the non-symbiotic nitrogen fixing organisms and the clover nodule organism is desirable altho not essential for this discussion. However, from experimental data available they have been divided as shown in the table, viz., fifty to sixty pounds by the former and eleven pounds by the latter as the yearly nitrogen fixation per acre. This credits the clover crop with forty-four pounds of nitrogen. From experiments conducted at Michigan comparing inoculated with uninoculated soybeans the conclusion was reached that forty pounds of nitrogen per acre, or ten pounds per acre per year, is a reasonable credit to be given to the soybeans in the four year rotation mentioned.

Taking all these points into consideration it seems reasonable to believe that in a well managed livestock system of farming, with the liberal application of acid phosphate and the regular use of limestone the nitrogen content of the soil may be gradually built up without the use of supplemental feeds or nitrogenous fertilizers. In time a point will be reached where the nitrogen loss in the drainage water and in crops grown will equal that secured from the air and returned in the manure, but this will not be until the yields have approached those indicated in the opening paragraph of this article. Such yields are by no means impossible of attainment but lie far beyond the results from average farm practice. In the same way the adoption of such a rotation and of such systems of management lie well beyond ordinary farm practice. In other words, this article does not deal with ordinary farm practice but holds up an ideal which experiments have shown is possible of attainment, and that with nothing more than the systematic application of well recognized good farming methods.

THE TRUTH ABOUT TRACTORS

By D. S. Fox

(Dr. Fox is assistant professor of agronomy at Pennsylvania State College. He gives some valuable information gathered from a study of fifty-four tractors on farms in central Pennsylvania.)

AN economic study of tractors was made last summer by the Division of Farm Management of the Pennsylvania State College. The object of the study was to secure data as to the actual cost of tractor operation under farm conditions and to study the con-

hilly. The soil was rather heavy loam. On several of the farms there were rock outcrops that were a more or less serious menace to plowing.

Cost and life of tractor. The average cost of the fifty-four tractors was \$959. There was a wide variation in



THE SEED BED IS PREPARED IN ONE OPERATION

ditions that affect the cost of operation.

Description of farms studied. The survey was conducted in central and southeastern Pennsylvania. The farms studied had an average of one hundred and twenty-three acres of crops, or nearly twice as many as the average farm for the region studied. The size varied from forty-one to two hundred and seventy-eight acres of crops. The type of farming was largely general. The topography varied from level to

the cost of different makes of the same horsepower due to a difference in quality. There was also a wide variation in the cost of the same make and horsepower due to the general increase in prices. The average value of the fifty-four tractors was \$794. This represents the average investment for the year studied.

The average estimated life of the tractor was eight and one-tenth years. The range of the estimates was three to fifteen years. The average tractor

had been used one and five-tenths years. None in the study had been used more than four years.

COST OF OPERATION

The cost of operating the tractor was considered under three headings, fuel cost, labor cost, and overhead or other cost.

The average fuel cost for all tractors was \$119.44 or \$2.36 per ten-hour day. The fuel cost for the gasoline tractors was \$3.32 per ten-hour day and \$2.06 for kerosene tractors. The approximate cost was \$0.12 for kerosene and \$0.25 for gasoline. In starting the kerosene tractors about \$0.02 worth of gasoline was consumed per day. The fuel was delivered to the farm in all but four cases.

The operator's labor was estimated to be worth \$0.25 per hour. The average cost of operating the tractor, fifty and six-tenths days, was \$126.48. The amount of work done by the tractor varied from fifteen and three-tenths days to one hundred and seventeen and eight-tenths days. For each ten-hour day, one hour was consumed in filling with fuel and water, oiling and adjusting, and nine hours in actual work. The kind of work done is shown in the following table. About forty per cent of the total work was belt work. This is probably above the usual demands of the eastern farmer. In addition to the wood sawing and feed grinding found on most eastern farms, these farms had an abundance of corn stalks to cut or shred and in many cases owned a small thresher.

TABLE I—KIND AND AMOUNT OF WORK DONE PER TRACTOR.

Kind of Work	Average Day's Work
<i>Tractor Work—Home</i>	
Plowing -----	11.2
Harrowing -----	8.8
Hay making -----	2.3

Manure hauling -----	1.4
Pulling binder -----	1.3
Other work -----	2.6
<i>Tractor Work—Custom</i>	
Plowing -----	1.6
Harrowing -----	.5
Other work -----	1.3
<i>Belt Work—Home</i>	
Threshing -----	2.3
Silo filling -----	2.7
Wood sawing -----	2.0
Feed grinding -----	3.0
Shredding -----	2.3
Other work -----	1.7
<i>Belt Work—Custom</i>	
Threshing -----	1.3
Silo filling -----	1.0
Wood sawing -----	.3
Shredding -----	.4
Baling -----	.9
Other work -----	1.7
Total tractor work -----	31.0
Total belt work -----	19.6
Total custom work -----	9.0
Total work -----	50.6

Overhead expense increases with age.
The overhead cost includes all other costs such as repairs, oil, labor, interest, depreciation and use of buildings.

The item for repairs was small on most farms as the tractors were new. Repairs costing \$100 or more were reported on four farms. The highest was \$150. The average cost of repairs was \$24.36.

All farmers used cylinder oil and hard oil, and many used a heavy oil for the gears. The average tractor used fifty-four and four-tenths gallons of cylinder oil or a little over one gallon per day. The average cost of oil per tractor was \$28.55 or \$0.56 per day.

The item for labor included all extra work on the tractor in overhauling, making repairs, storing or hauling fuel. The average cost of man labor was \$9.34. Interest was charged at five per cent on the average value of the tractor. The average charge for interest was \$39.72.

The average life of the tractors was

eight and one-tenth years. The depreciation using this life and a junk value of five per cent was computed by the compound interest law with a decreasing function. The depreciation thus secured averaged \$269.10.

An estimate was secured of the farmer of the value of the building or position of the building used by the tractor. A rental charge of ten per cent was made on the value. The average cost per tractor was \$4.83. The total overhead cost per tractor was \$376.20. The following table gives a summary of the costs and the total cost.

TABLE 2—SUMMARY OF COST OF OPERATION PER TRACTOR.

<i>Item</i>	<i>Average Cost Per Tractor</i>
Fuel	119.44
Labor—operating	126.48
Repairs	24.36
Oil	28.85
Labor for repairs, etc.	9.34
Interest	39.72
Depreciation	269.10
Use of buildings	4.83
Total	622.12
Cost per day	\$12.30

FACTORS OF COST OF OPERATION

The limited number of records has not been sufficient to make a detailed study of tractor operation. The results are thus limited to a few general factors.

Size of farm. The tractor cost least on the large farms. Small farms not having sufficient work at home did the most custom work and thus reduced the cost. Unless custom work is done the farm should consist of at least one hundred acres of crops.

Amount of work. There was a direct relationship between the amount of work done and the cost of operation. There should be a possibility of at least fifty days of work for the tractor if

one is to expect to equal the average cost of \$12.30 per day.

TABLE 3—RELATION OF DAYS OF WORK TO COST OF OPERATION

<i>Days of Work</i>	<i>No. of Farms</i>	<i>Cost per Day</i>
30 or less	23	\$19.97
31 to 50	18	12.77
51 to 70	11	11.87
Over	12	9.85

Size of Plow. Of the fifty-four farms, nineteen pulled two-bottom plows and twenty-six pulled three-bottom plows. One farm did not plow with the tractor and the balance used both two and three bottoms. As the table shows the three bottom plows are somewhat more economical. However, these tractors were operated more days and this is probably the chief factor in determining the cost.

TABLE 4.—COST OF PLOWING.

<i>Size of Plow</i>	<i>No. of Farms</i>	<i>Cost of Tractor</i>			<i>Days of Work</i>
		<i>Per Acre</i>	<i>Per Plow</i>	<i>Per Acre</i>	
2 Bottom	19	\$2.50	\$0.67		48.2
3 Bottom	26	2.04	.70		54.1
Ave. of all.....	53	2.33	.71		56.6

Summary. No single factor seemed to have the effect that the number of days the tractor was used had. The overhead cost did not vary in the same ratio as the amount of work done, hence, the cost of overhead per day is less on those farms doing the most work.

The operator seemed to have some effect on the cost of operation. The cost per day was \$12.82 for hired men, \$12.16 for owner and \$10.75 for owner's sons. The son took better care as a repair bill of about one-half the average shows.

A final test of the tractor's efficiency is measured by the number of horses displaced. On the fifty-two farms that had been operated before buying the tractor an average of one and nine-tenths horses were disposed of.

POSSIBILITIES OF SPRING WHEAT IN OHIO

By C. G. WILLIAMS

(Mr. Williams, associate director of the Ohio Experiment Station, rates spring wheat as an uncertain crop and cautions farmers about increasing their acreage of the crop unduly this spring.)

OWING to the world shortage of wheat a year and more ago there was a great incentive to increase the acreage of spring wheat in the winter wheat belt, and accordingly there was an unusually large acreage of spring wheat seeded in Ohio last year. Fortunately for both the producer and consumer, the weather conditions for 1918 favored very early seeding and a very large yield per acre of wheat of high quality. The yield of spring wheat at the Ohio Station was eighty-five per cent larger than the average yield of the preceding six years. As a rule the yields were good all over Ohio, particularly in the northwestern quarter of the State. The yields reported to the writer range from twelve to fifty bushels per acre.

With the fine showing of last years there will be a tendency to increase the acreage unduly the coming season. It will be well to remember that several tests at different points in Ohio have shown that on the average winter wheat has out-yielded spring wheat by nearly fifty per cent. This will likely not prove true of northwestern Ohio, where winter wheat is somewhat uncertain. With the results of less favorable seasons in mind one should go slow in putting land in spring wheat which might well go in corn, for even at the guaranteed price for wheat it may prove to be a losing business. It is quite possible that oats may be a more profitable crop in many instances.

The variation in the yield of spring wheat under different conditions in a favorable season like 1918 is shown by the results at several county and dis-

trict experiment farms in the following table:

County	Date of Seeding	Yield
Cuyahoga	-----Mch. 30	45.4
Trumbull	-----Apr. 2	26.3
Hancock	-----Apr. 4	24.5
Miami	-----Apr. 5	23.3
Wayne	-----Apr. 6	33.2
Hamilton	-----Apr. 6	20.0
Mahoning	-----Apr. 20	17.7
Meigs	-----Apr. 23	12.3

Attention is called to the date of seeding. Early seeding is associated with high yield. It will be noted also that the highest yields are from the northern part of the State.

The importance of early seeding is further brought out in tests in Trumbull County, in which Blue Ribbon Spring wheat was seeded at two different dates as follows:

Date of Seeding	Yield per Acre
March 20 -----	28.83
April 20 -----	17.17

The above figures indicate that unless one can seed spring wheat early, it may not be worth while to seed at all.

Experiments to determine the most profitable rate of seeding with spring wheat were conducted at Wooster last year, with the following results:

Variety	Pecks of Seed Per Acre	Yield Per Acre
Blue Ribbon -----	6	28.92
Marquis -----	6	21.75
Blue Ribbon -----	7	33.17
Marquis -----	7	25.00
Blue Ribbon -----	8	31.75
Marquis -----	8	25.92

Excellent yields have been reported to the Station from the use of five and six pecks per acre, but the above test would indicate that under some condi-

tions as much as seven pecks per acre is desirable.

The two principle varieties grown in Ohio are the Blue Ribbon and the Marquis. At Wooster the Blue Ribbon has quite uniformly given the better yields, though at the University farm, Columbus, there was little difference between the two. Both have given good satisfaction in the northwestern part of the State. The Blue Ribbon is a bearded wheat; the Marquis, smooth.

Land needs to be in good state of fertility to produce a profitable crop of

spring wheat. It will usually pay to drill from two hundred to three hundred pounds of acid phosphate per acre when seeding.

There is quite a general tendency to discourage the use of home grown spring wheat for seed. There is good foundation for this season's when local seed is of poor quality, as is not infrequently the case. But good, plump home grown seed has been found as productive as seed brought in from the Northwest, even though it has been home grown for several generations.

SOIL IMPROVEMENT BY COMMUNITY ORGANIZATION

By S. B. STOWE

(Mr. Stowe is county agent of Clermont County. He has several years' experience to back his ideas on organizing a community for improvement. Small group organization is necessary for a successful county-wide campaign. Read how Mr. Stowe organized his county for soil improvement work.)

TEN men were seated around the fire a few mornings ago talking about growing clover. We asked them one by one how many successful crops of clover they had grown in the last ten years. Nine of the ten said that they had not been able to grow any clover during the last ten years, but they pointed to one man who had grown two successful crops of clover and said that he was the man who knew how to grow clover. We asked this man to tell us about it. "Well," said Mr. Burdsall, "I attended one of your soil fertility meetings at Mr. Carr's three years ago and heard you and Mr. Bachtell talk about soil improvement and growing clover. You said to us to use manure on the wheat and plenty of acid phosphate. I have been doing that since that time and I find that I have no trouble to grow clover."

I did not even remember of having ever seen Mr Burdsall before, but it was with considerable pleasure that we

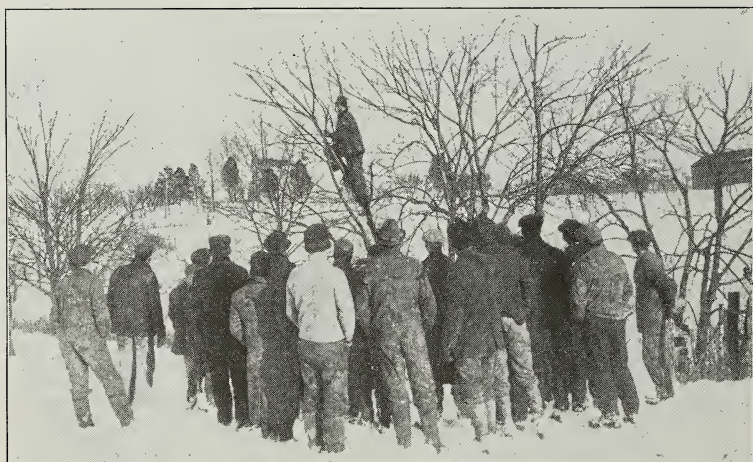
heard him make those statements. They lead us to the conclusion that after all, perhaps some of our work, which at the time may seem fruitless, will at some future date yield good results.

I dropped down into Clermont County almost three years ago, a stranger to everybody. As one would usually expect, in a short while we made the acquaintance of the folks about the county seat, and began to make inquiries about the good farmers of the county. Occasionally we were asked to visit a grange meeting, but there wasn't any organization that had planned or expected the County Agent to do any particular thing. He had just come, and the job was all his own.

Neither did we get much encouragement from the County Agent Leader at that time as to just what we were supposed to do. In due time, however, one or two of the specialists called on us and we talked over a few things in a

very general sort of way, and it was finally decided that perhaps a series of twenty-five soil fertility meetings, scattered over the county, would be a good thing. After considerable scheming, we managed to make up a schedule of these meetings and get into communication with men who were more or less interested and who agreed to invite a few of their neighboring farmers in to talk over the problem of soil improvement. At that time, practically all the talking was done by the specialist who came with his well prepared charts and

of farms in the county. By consulting a few of the leading men about the method of farming followed by the farmers of the county we were able to understand the methods and ideas of farming that seem to predominate in the minds of the men. During the second summer another campaign was put on. This differed from the work of the first year in that small cards were secured on which had been placed figures giving the yields of crops that resulted from different kinds of treatment. At the opening of the meetings these were



A PRUNING DEMONSTRATION

tables and gave a general talk on soil fertility. The men gathered around, usually under a shade tree in the barn yard, and listened to what was said. A short discussion would sometimes follow and then the men would go to their homes, apparently pretty well satisfied for having spent the time in such a way.

This first year's experience started us to thinking, and more complete plans were made for the work of the second year. First, we decided that a rather detailed study should be made of the productivity of a considerable number

passed around to the men and the soil specialist, who usually presided at these meetings, referred to them frequently in his talk. Exhibits were also prepared showing the comparative yield of crops from the various soil treatments. Some pictures were also provided, which illustrated the points in mind, but at the close of the meeting, following an opportunity for a discussion, the men would go away without having generally committed themselves as to just what they thought about things.

As the situation was studied over, it

became apparent that if we were to succeed in getting anywhere with these men, it was necessary to understand rather fully their own point of view, and so far as possible, to lead them to express just the way they looked at the various problems that we might have up for consideration. Another point emphasizes itself at this time. There are about three thousand farmers in the county, and it was evident that to reach anywhere near this number of men, it was necessary to have a rather com-

and points for the organization of about eighty groups were selected. A man who knew something of the character of the work was selected to become the group leader and to organize his group. We thought of ten men as being a minimum number for a group.

The theory for this group organization rested on the fact that by personal visits it was a practical impossibility for the county agent to reach but a comparatively small number of the farmers in one year. On the other hand,



THE COUNTY AGENT AT A ROADSIDE MEETING

plete and detailed organization of these men. The group, or unit idea, which we had been following in a rather haphazard way the two previous years, seemed to lend itself admirably to the situation. The matter was talked over with the chairman of agricultural activities of the various townships, and they also agreed that some such plan of organization was feasible. An executive committee meeting was held where plans for putting on the campaign were worked out in a rather detailed way,

experience had taught us that, if these men were gathered together in large bodies the talking was done by only a very few of the men present, and the majority left without having had any opportunity to ask questions or express their opinions. The small group or unit plan was a go-between. Ten or fifteen men might easily gather around the fireside or under a shade tree or in a corn field and talk over topics of interest in a very informal way. This situation gave any man an

opportunity to express his ideas and to ask questions. For the past year we have followed out this plan of meeting men in groups and find that it multiplies the possibilities of the work many fold. We have given up the idea of lectures to the men. The most of the work is done by questioning the men individually and getting them to express their opinions. Quite often the men themselves will develop the idea to the point desired. Sometimes it is necessary for the county agent to elaborate a little and bring out the point a little more fully, but we truly have been surprised at the ability of our farmers to bring out and clinch the different points for themselves.

We found that it requires extremely careful preparation to put on a successful campaign. First we usually proceed as follows: after the executive committee has decided to push a certain thing, for example the growing of more clover, a questionnaire is sent out to twenty or twenty-five men, asking them to ask two or three questions, the answers of which they believe would help them and their community to grow better and more clover. The questions that come in are usually to the point. The soils or farm crops committee then get together and with the help of the county agent and sometimes the specialist, work out the answers to these questions. If the specialist wasn't present at the meeting, the answers would be submitted to him for review before using them in the county-wide campaign. Of course the county agent has found it necessary to have a rather definite and detailed program of work in mind at the time the committee comes together, else they will be going off on tangents and lose the main issue. It requires only a little tact to hold them to the point.

Following the accumulation of this material, it is worked over and prepared for the printer. The men always wish to back up what they say by describing briefly the experience of a local farmer who has had an experience which agrees with the principle that they are trying to establish. This may often be further emphasized by the use of a few good illustrative pictures. We also find it well to put the work in such a way that the men can visualize the result. A timely demonstration or an arrangement whereby the men can do some figuring for themselves, each man using his own farm problem to figure on, are satisfactory. Once the material is all prepared and well in hand, the meetings are dated township by township. During the winter months at least two meetings a day are held, each of which is two hours long, one hour is devoted to the discussion of one subject and the second hour to another. We have gotten away from the use of general subjects, but prefer to pick out some particular thing, such as methods of saving potash, rational use of acid phosphate, clover growing, and any of the large number of things that might be selected.

The men of the neighborhood gather at the home of the man at whose place the meeting is to be held. At the opening of the discussion each man is given a pamphlet or poster containing the gist of the material to be talked about. This may or may not be followed in the discussion, but, since it is a summary of what has been said, we believe that it is desirable for the farmer to take it home and to look it over and think about it again.

In this article we have rather confined our idea to the thought of soil fertility work, but we find the plan just as

(Continued on page 416.)

TRAINING FOR RURAL LEADERSHIP IN AGRICULTURAL COLLEGES

By PAUL L. VOGT

(Professor Vogt, formerly connected with the Rural Economics Department at Ohio State University, has charge of the rural phase of the church extension work of the Methodist Church. The importance of agricultural training for rural leadership is the theme of his article.)

IT is impossible within the limits of one article to discuss adequately the problems connected with training for the leadership demanded by the modern rural community. The relatively simple volunteer leadership required by a pioneer life has been giving way rapidly to a trained leadership as required by the far more complex problems of modern life. This complex modern de-

ers' associations of various sorts. In social organization there is now a definite demand developing for county leaders who will centralize responsibility for the administration of a county and local funds for the relief of the poor; the care of orphans; the supervision of jails and lockups; and the improvement of housing and health conditions. In educational circles the supervisors of



COUNTRY CHURCHES NEED RURAL LEADERS

mand may be illustrated by the growth of the country agricultural agent movement; the demand for women as leaders in developing better housing and health conditions; the increasing of opportunities for service in the growing co-operative movement among farmers; and in the paid secretaryships of state and national organizations, such as the Grange, Farmers' Union, and produc-

schools have demonstrated their value in increasing educational efficiency. There is a movement on the part of farmers to assume larger responsibility in politics as is shown by their control of county commissionerships in many sections; by their definite entering into politics through the rapidly spreading Non-Partisan League, which is really a national expression of a farm con-

siousness in political affairs.

Reports are coming from all over the country that farmers in their religious life are beginning to demand a type of leadership adapted to the country and are not longer willing to accept leaders who earnestly desire and pray for "promotion" to a city charge and who are accordingly disappointed and disinterested when given rural work. They want ministers who believe in the country, who love country people and who are trained for leadership in rural life.

It is with reference to the relation of our agricultural colleges to the training of this latter group that this article is written. It should be said that the type of rural ministerial service with which many agricultural students are familiar and which has turned many of them away from the ministry as a life work is distinctly not the type of service for which the agricultural college must prepare. The close personal contacts of the minister as an advisor and friend in times of pleasure, as well as in times of sorrow and trouble must still remain an essential element of his service; and the one who does not really love to serve his fellowmen had better keep out of the ministry of the future because in any case he will be driven out. But the modern minister must have a vision of a rural civilization that is the equal in its life giving qualities to the best in the whole social organization anywhere. The minister, who laments because he has been assigned to a community where the houses do not have running water and inside toilets and are heated with stoves and lighted with oil lamps; where the roads are impassible in winter; where doctors are not available except after hours of waiting; where the people no longer know how to play or care to do so; where there are no college graduates and few who have graduated

from the common schools; and where agriculture is so poor that his own material reward is a constant burden, has no place in the rural community. These conditions exist everywhere and call for a spirit of manhood and love and faith like that of John Frederick Oberlin. It is this type of leadership that the rural community demands.

What are the facts as to the need for leaders of this type? The writer will draw his illustrations from the experience of the Methodist Episcopal Church because this organization is so largely rural and because facts as to the status of leadership in this church are more available. They are typical of other religious groups.

The Methodist Episcopal Church has over 12,000 "rural" charges, that is, churches or groups of churches each under the direction of one minister in communities of less than twenty-five hundred inhabitants. At the present time nearly twenty-five per cent of these charges are in the "supply" list, or are charges for which regularly ordained ministers are not available and are consequently filled by men who do not meet the requirements of the conferences in their educational preparation or who are primarily engaged in some other type of work, such as teaching, farming, or in business of some sort. The proportion of "supplies" is increasing year by year. In the Southern Indiana Conference the number of supplies increased four times in the past twenty years; in the New Jersey and the Central New York Conferences the number of supplies increased more than twice in the last ten years. This condition presents itself in one of the typical "rural" churches at the beginning of the greatest campaign for church advance in church history, when rural Methodism is asking for \$11,000,000.00

and more for increasing church efficiency. The lack of trained leadership will be the greatest handicap of the next few years unless educational institutions rally to the cause of supplying men and women trained for the service demanded of the church by rural communities today.

These illustrations from the Methodist Episcopal Church may be taken as typical of all rural work in America. Other great religious organizations are now making their plans for cooperation in a gigantic missionary campaign next year so that all will be cooperating in the movement to make the Church effective as a leader in rural civilization. The problem of leadership in other groups is as serious as in the organization mentioned.

Now what is the relation of the state institution to this problem? There are about twenty-five thousand Methodist students in state supported institutions. In most of the large state universities there are more Methodist students than in the average Methodist college. Yet the statistics show that comparatively few leaders in religious work come from state institutions. Since emphasis upon creed has given way to the spirit of cooperation among the various organizations in seeking for a common basis for community service, and since the concept of the church as an agency for human progress has so vastly enlarged in the past few years, the state institutions should provide their full share of consecrated young men and women who are dominated with the spirit of sacrifice for the ideal of making the world better for humanity, and who take seriously the ideal of the possibility of a Brotherhood of Man both in America and in the world at large; and who are willing to go into the hard places in rural life on low salaries if need be and

there help country people to a realization of the ideals of better homes, better schools, better farms, better roads, better health conditions and the improvement of every condition that makes the country less desirable than the suburban community.

It is always desirable that as far as possible every rural minister attend short courses at some standard College of Agriculture for at least one season. He should also, while taking his college work, get as much practical experience as possible in club organization and leadership and should elect as much of his college work as possible to history, political, social and economic science, philosophy and psychology.

Women who are interested in rural work should specialize in domestic economy with special reference to problems of health and sanitation, in addition to problems of individual and social ethics.

A study of the courses suggested indicates that with little modification any state institution with a college of agriculture and domestic science, can with very little modification of its present curriculum, cooperate with the great religious bodies of America and of the world in preparing young people for the challenge which these organizations now offer for service. The time has now passed when it is necessary for young people to seek outside of the church for an opportunity to express their desire for Christian service. The church has broadened its program to meet modern demands upon it and is now seeking leadership of the highest caliber in personality and training for its new program.

It is hoped that state institutions with their able young men and women may contribute their share to Christian service both in and outside of the church in years to come.

ECONOMICAL STOCK FEEDING

By E. E. BARNES

(Mr. Barnes is county agent of Sandusky County. He gives in his article some timely suggestions on ways of choosing rations and methods of feeding for the greatest economy in production.)

IN feeding stock for profit the chief consideration is a choice of feeding stuffs from which one gets the greatest production of meat, eggs, wool, milk, or energy for the investment. Our only guides in these selections are the chemical analyses and feeding experiments. If either one of these factors are missing the other shrinks in value. Only by actual feeding experiments can the digestibility of the material be determined.

Much experimental work has been done to determine the correct amounts and proportions of protein, carbohydrates and fat necessary to insure economical production. These have been compiled into tables known as feeding standards. They deal in digestible units only, hence if one is ignorant of the percentage of digestible material even tho he knows the analysis as given by the chemist, he is helpless to use the standard. This is the plight one is in when using ready mixed feed of unknown origin. The digestibility might be estimated if one knew for a certainty what had been mixed, but usually these are given incompletely if at all.

A ration which fits the feeding standard exactly might fail in result if no attention were given the item "ash." In our common feeding standards no consideration is given this important food substance. Lack of ash makes weak bones and irritable nerves and no animal can return a profit to the feeder when in such a condition. Hence we must select feeds for our ration containing plenty of ash. The corn plant as a whole is low in ash, while the legume hays are high. Animals which do not

eat hay may be supplied ash in tankage.

During the period of the war much change in the quality of feeding stuffs has been noted. More intense milling of wheat has resulted in lowering the quality of middlings and bran. This made analyses and feeding experiments reported in past years of doubtful value in connection with these feeding stuffs. Some feeds especially those by-products of the manufacture of liquor have become a thing of the past. This upset the entire feeding program on many farms where these feeds had ranked high in importance. New price ratios were a result of the war and made necessary frequent changes in the feeding in order. For instance a year ago barley sold for more than \$2.00 a bushel, now the price is about \$1.00.

The feeder who does not change his ration with price changes is most of the time feeding a non-economical ration. He perhaps would not hesitate to change the brand of gasoline he uses in his automobile, if it were shown that he could cover more miles per dollar with a different brand, but he has often developed a sentiment in favor of some particular feed or has inherited one from his father which is hard to break. Many men hold such a prejudice regarding tankage and go on producing pork at \$18.00 per hundred weight on corn alone, when they might produce it at \$13.00 by using tankage.

The method of feeding animals often has a bearing on the economy of production. Self feeders for hogs and beef cattle are becoming more and more popular. If fed by hand small pigs must be fed often while the self feeder

solves this by allowing the pig to help himself. Many breeders of pure bred animals object to self feeders for breeding stock on the grounds that they become too fat, but for making rapid gains on animals designed for market they are recommended by feeders and experiment stations alike.

Few feeders have exactly the same problem to solve in deciding upon a ration. The roughage raised on the farm should in most cases be consumed

concentrate must be high in protein to supply enough without furnishing an excess of total digestible nutrients.

Another consideration in selecting a feed is the relative costive or laxative effect of a feed. Some feeds have a marked loosening effect; others have the opposite. In general, succulent feeds are desirable because of their loosening effect. Cotton seed meal and oil meal, while both high in protein, have opposite effects in this respect. Mo-



SELF-FEEDERS ARE BECOMING MORE POPULAR

there, to save the expense of handling. If this is from leguminous plants the type of concentrates which should be fed will be quite different from that on a farm affording only corn stover and timothy hay as a roughage basis. In the former case where leguminous roughage furnishes a considerable proportion of the required protein the concentrates fed need not be high in protein, which usually results in reducing their cost. In the latter case with a non-leguminous roughage as a basis the

lasses from beets has a marked laxative effect, often excessive; while that from cane does not. This, however, is somewhat of an individual problem and must be regulated to the needs of each animal.

Some feeds, notably cottonseed meal, contain poisonous substances, which are detrimental if fed in large amounts. Two pounds of cottonseed meal per day per one thousand-pound animal is usually considered safe for cattle, but

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THE WOOLLY APHIS

By E. W. MENDENHALL

(Mr. Mendenhall is head of the Bureau of Horticulture in the State Board of Agriculture. He tells how to combat the insect that causes more trouble in the nurseries of Ohio than all other pests combined.)

THE woolly-aphis is one of the most destructive insect pests of the apple and pear. It is known in America as the Apple Blight; in Europe it is called "American Blight." It is thoroughly distributed over the United States, being present wherever apples are grown.

It is one of the best known pests of the nurseryman and fruit grower and the chief insect attacking the roots of the apple tree. The aphis is liable to be planted with the tree, being on the roots of the tree when it arrives from the nursery. They are readily recognized by the woolly character of their bodies. When abundant they appear in bluish white, cottony masses. The insects are usually most abundant on roots, but they may appear above the ground on branches, trunk and young shoots. They form smooth gall-like growths of all sizes. These growths can usually be distinguished from those of crown-gall by the smoothness of the formations.

The insect is especially injurious to young trees. When badly attacked the tree becomes sickly and the foliage turns yellow. If death does not result from the direct effect of the aphids, the tree falls an easy prey to borers and other pests.

The damage caused by woolly apple aphis has been so widely recognized, particularly on nursery stock and young trees, that several states have taken legislative action. It has caused more trouble in the nurseries in Ohio than all other pests combined. The loss sustained by the nurserymen in the state has run up into millions of dollars.

From the nursery and orchard report for 1908, in one apple block of forty thousand trees, it was estimated that seventy-five per cent of the trees were injured to such an extent as to render them unsaleable. The same block was lifted in November and by actual count ninety per cent. of the trees were discarded because of root injury caused by these insects. Apple stock cannot be grown with profit under such conditions.

Nurserymen have never been able to do much to control woolly aphis. It has become so destructive, especially where apple has been grown for a long time, that growers have discontinued raising apple stock.

On infected trees aphids will be found in all stages of growth. They are most numerous on the roots in early spring. In summer, especially during the months of July and August, they are exceedingly abundant upon the limbs of the trees, covering large patches with their extensive colonies. Early in the fall a generation of winged aphids appear, which migrate to other trees. They are about one-twelfth inch long and have a wing expanse of one-quarter inch. They appear to be black, but the abdomen is really dark yellowish or rusty color when closely examined. Each of these winged females gives birth to about six wingless males and females, which are deposited on the trunk of the tree. The sexes are wingless, much smaller than the summer forms, and are without beaks so that they take no food. The female is a brown ochre color and the males dark green or greenish brown. They become full

grown in eight days. Then they mate, and the female lays a single large black egg, which is deposited in the crevices of the bark on the lower part of the trunk. These eggs hatch in spring and forms the foundation for a new colony.

The apple is the favorite food of this insect; it also feeds quite extensively upon the root of pear trees. There is considerable difference in the effect of aphids upon the different varieties of the apple. The Northern Spy is practic-

aphis on nursery stock. Several materials were used to kill the root form. The best results were secured from the use of tobacco dust. These treatments were made, however, during the spring and summer when the trees were in a vigorous growing condition.

In sections where tobacco is grown nurserymen use tobacco stems quite extensively to destroy the aphids. It is applied along the rows, which kills some aphids and acts as a repellent.



APPLE TREE ROOTS SHOWING WOOLLY APHIS INJURY

ally immune. In Australia the aphid is a serious pest and has been successfully combatted by the use of Northern Spy roots. These roots have proven equally effective in California. Vigorous growing varieties, such the Rhode Island Greenings and Bellflower are susceptible to severe injury.

In 1908, 1909, and 1910, Ohio carried on some experiments in the Miami valley for the control of woolly apple

After the aphid has attacked the roots, it is not easy to kill, because it is hard to reach with a spray and, if treatment is made, the soil must be removed from the roots sufficiently to expose the infected area. Spraying with "Black Leaf 40" is recommended, using 1 pint plus 3 to 4 pounds of soap to 100 gallons of water (a dilution 1 to 800) with high pressure from 200 to 250 pounds. The spraying must be

done thoroughly to penetrate the woolly covering of the aphid and wet their bodies.

Tobacco is the universal insecticide for aphids. Dilute miscible oils and kerosene emulsion are used in a limited way. The latter sprays, however, are injurious to the roots and often result in the death of the tree.

No doubt the kind of soil trees are grown in has something to do with root infestation. A hard soil—one that cracks, allows the insects to reach the roots. For this reason cultivating is beneficial.

The aphids may be destroyed on the foliage by spraying with seven per cent kerosene emulsion, miscible oils diluted thirty to forty times, whale oil soap, one pound to six gallons of water or tobacco extracts, black leaf being used, one part to seventy of water. It should be ap-

plied in a strong spray so as to thoroughly wet and penetrate the waxy covered aphids.

The winter spray of lime sulphur wash destroys the hibernating aphids on the trunk and doubtless kerosene emulsion or miscible oils applied early in the spring for the San Jose scale will destroy the eggs.

Several insects prey on the woolly apple aphid, but are not an economic factor in the control of this pest. The economic problem in the nursery is essentially different from that in the orchard, because the inspection insists on stock being entirely free from any sign of the presence of the aphids.

Badly infested stock should be destroyed. All trees should be dipped in a soap or lime sulphur solution to prevent orchard infestation of aphid and San Jose scale.

PUBLIC HEALTH AND THE RURAL HOME

By DR. EMERY R. HAYHURST

(Dr. Hayhurst has charge of the Department of Public Health and Sanitation at Ohio State University. He presents some timely thoughts on rural health problems.)

THERE are reasons to believe that health is not monopolized by rural districts; in fact, some claim that urban centers have surpassed rural districts in regard to the state of health of the inhabitants.

The state of sanitary science in the country concerns the home farm and its neighbors and the places where people assemble. If people did not intermingle or exchange goods, a large part of the public health question would not apply to rural districts; but transmissible diseases, it appears, are very prevalent and about as readily spread there as in cities.

I. THE RURAL HOME.

Preventable or reducible sickness is divided into four classes: (1) dis-

eases of infancy, (2) communicable or transmissible diseases which are especially prevalent in childhood, (3) consumption (tuberculosis) and typhoid fever—diseases of young manhood and young womanhood, and, (4), degenerative diseases, which pertain to middle and later life. I will not consider degenerative diseases in this paper. They are believed to occur later in life or with less frequency in rural dwellers than among city dwellers.

Most transmissible diseases are preventable. For this purpose, the sanitarium looks first to the character of the drinking water supply. There are definite standards for the farm well; also for drinking water, whatever its source. The second point of scrutiny

is the matter of waste disposal, particularly of human excrement. There are standards for the farm privy. The communicable diseases themselves come next. Some flat rules concerning these can be stated. Children, especially, must be watched—your own children and your neighbors' children. This watching is a part of the duty of the mother and of the school teacher. The safe procedure is to suspect that every

The second group of diseases should never be had. They are: diphtheria, pneumonia, scarlet fever, smallpox, typhoid fever, infantile summer complaints, syphilis, gonorrhea, influenza, tonsilitis and common colds; the last two named are usually contagious and often prove to be most unusually severe in the complications which follow. Vaccination and inoculation are preventives against three or four of these, viz.,



POLLUTING THE DRINKING WATER

child, previously healthy, who becomes rather suddenly sick has a contagious or communicable disease.

The minor contagious diseases are: chickenpox, german measles and mumps. None of these should be had by children until they are at least five years of age. The major diseases are of two groups: first, whooping cough and ordinary measles—diseases which, in a life's experience, cannot be avoided, and which are preferably had in childhood between the ages of six and twelve; but no family having little children (under six years of age) should permit exposure of older children "to catch the measles or whooping cough," as it is quite impossible to prevent its spread to the smaller ones.

smallpox, typhoid fever, diphtheria and some forms of pneumonia.

Tuberculosis is a contact disease among children but not among adults. It is also a milk borne disease, the germs coming from tuberculosis cattle. It is nearly always acquired in infancy or early childhood; it lights up in young womanhood or manhood as consumption. It is just about as prevalent in rural districts as in cities in Ohio. The standard of procedure is simply this: that sick persons, and especially children, be isolated quickly from the balance of the family and from other children until the diagnosis of what is the matter has been made.

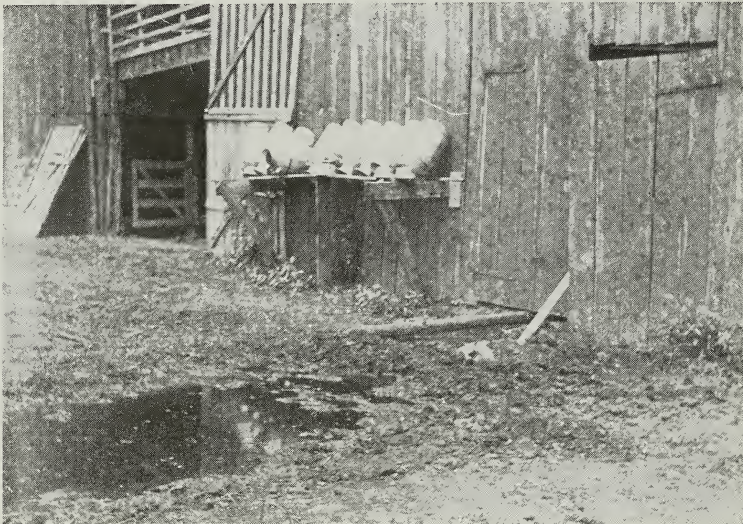
The fourth factor on the rural premises is the ventilation of the house. To

build up good resistance to disease, it is much better to dress a little warmer than to overheat the living room or shut up the air. Ventilation is often by no means what it should be when left without scrutiny or supervision. The standards for ventilation are: first, temperature not too high—60° Fahrenheit on the ordinary dry-bulb thermometer is enough; 27° F. on the wet-bulb thermometer is about right. The air should always have a slight move-

body and especially to the person who must stay indoors most of the time.

THE RURAL COMMUNITY

A community of neighboring farms has many health problems of common interest. In many respects, these are the same identical problems which occur in more congested districts. The constant betterment of communication—good roads and automobiles and centralized schools—renders rural districts more and more like cities in the



GIVING DISEASE GERMS A CHANCE

ment in the occupied room. When one is sitting still it should move the least; a just perceptible breath noticeable against the cheek is sufficient. When one is sleeping or doing active work, the air should move faster. Window adjustments and ventilator boards at windows or, better still, hot air furnaces with openings between occupied rooms and floors for recirculation of air will invariably provide these air movements. Variation in the three factors—air movement, temperature and humidity—are very desirable. Such changes prove a tonic to the human

matter of spread of transmissible diseases. Hence, to control such diseases, an active community health organization is as much needed in country districts as in cities. Supervision for health should come before that for industry or schooling.

In the State of New York in 1914 it was discovered that the death rate for the city of New York, which had been gradually falling for years, had reached thirteen and seven-tenths per thousand, while during the same time the rural rate for the state had remained practically stationary at fifteen

and five-tenths per thousand. Because of this showing, the State Grange recommended to the State Commissioner of Health that a division of Rural Hygiene be added to the State Department of Health.

If the present Ohio Legislature makes it possible to set up county or district health councils in the state, local rural health organizations, mutually formed, could benefit much by getting in touch early with these councils. If the legal districts remain as at present, these voluntary health organizations should organize and co-operate with them and bolster them up. At present, in your district, there is either the township health officer or the township board of health in lieu thereof. The first procedure, after organization and proper affiliation, is the setting of minimum standards. These concern, first, the water supply and waste disposal of each farm in the neighborhood. The State Department of Health supplies literature on standards for practically all health purposes.

"Getting together" and setting up standards for your neighbor's well and privy, as well as your own, may prevent much disease in your own family (due to visitiing back and forth and the co-mingling of children); so may, also, standards for the conduct and care of the sick. Set up the rule that sick individuals shall be promptly isolated, bag and baggage, especially children, including, also, those with common colds and sore throats and any form of skin rash which has appeared more or less suddenly, and kept isolated in a separate room or place until a diagnosis has been made.

Next, arrange with the Board of Education for a medical inspection of each school child, to include the common defects—eyes, teeth, tonsils, hearing, skin,

and some nervous afflictions. (During the State School Survey, the author found physical defects among country school children to be the same and to have the same frequency as among city children.) Arrange, at the same time, to have defects in children followed up and corrected thru a system of notification and supervision.

Has your school-house, built perhaps twenty-five or fifty years ago, ever had a sanitary inspection? The Stark County school-house survey, in which the author investigated sanitation in one hundred and ninety rural school-houses, showed glaring health hazards to predominate in most of them. The situation is probably the same in most of the other counties of the state.

In a dairy community, co-operate with the dairy inspection bureau and the local health authorities, which in this state—at present—usually means, bolster up the local health authorities. Arrange to have milk production checked by some score card method, such as is required by certain of our larger cities. Milk is a principal food, not only for human beings, but for disease germs, and practically all communicable diseases can be spread thru milk.

Since the present control of transmissible diseases in farm communities is not to be compared to the same in organized cities, it follows that these diseases spread more universally, and, in the end, more thoroughly, in rural districts than in our cities.

To sum up, then, let several people who are neighbors start a local health organization for mutual protection. Get in touch with local health officials and the State Department of Health. Set standards and insist that the authorities enforce them. Make the country as healthy as the city.

TOWNSHEND AGRICULTURAL SOCIETY— ITS HISTORY AND DEVELOPMENT

By THE EDITOR

THE first organization of agricultural students at Ohio State was formed in October, 1883. At this early date in the history of agriculture at the University, W. S. Devol, '86, W. C. Mills, '98, and W. P. Bently, '85, with the assistance of Prof. W. R. Lazenby, formed an agricultural literary society. Dr. Townshend, then professor of agriculture, proposed the name of "The Kirtland Agricultural Society," after his friend and co-laborer, Dr. Kirtland.

Meetings of the society were held every other Friday evening in University Hall, with regular literary programs. Dr. Townshend and Prof. Lazenby were active members and were largely responsible for the progress of the society. However, when the student promoters graduated, the interest taken by the students was greatly diminished. In 1889, Prof. C. P. Fox, then taking his doctor's degrees in agriculture, was elected president. The literary interest was revived to some extent, only to vanish when he left the University.

In 1890, several energetic students, including H. H. Richardson, '92, F. P. Stump, '92, and F. W. Rane, '91, formulated a program for advertising to increase the interest in the agricultural department. An increase of enrollment resulted from their endeavors. Encouraged by their success and realizing the value of literary work to the agricultural men, they called a meeting in January, 1893, in the reading room of the old Horticultural Building, and formed a society known as "The Association of Agricultural Students." Charles W. Burkett, '95, now editor of the *American Agriculturist*, was elected presi-

dent. During his term of office the association prospered, the students and the agricultural department both being benefited from it. The Association was largely responsible for the rapid increase in enrollment in the agricultural department. The total attendance was forty-seven in 1893, which increased to ninety in 1896.

In September, 1894, R. W. Dunlap, '95, was elected president. The society developed so rapidly that it outgrew its constitution. It was decided that the name "Association of Agricultural Students" meant too little, so it was changed to Townshend Agricultural Society, in honor of Dr. N. S. Townshend, who for a quarter of a century was professor of agriculture at Ohio State, and was largely responsible for the early development of the agricultural department at the University.

At this point in the history of the Agricultural Society a new feature appears. C. W. Burkett, '95, and J. F. Cunningham, '97, "launched their frail and untried bark on the sea of journalism." Their journalistic efforts materialized in a twelve page paper, "The Agricultural Student." It was due greatly to the assistance given by their fellow members of the Agricultural Society, that they were able to put forth the first Agricultural College Magazine ever published in the United States.

Townshend Agricultural Society never had a permanent home until the erection of Townshend Hall in 1898. Then, due to the efforts of H. C. Price, '00, and W. C. Mills, '98, and others, a society room designed and con-

structed purposely for the Agricultural Society was secured.

After establishing itself in the new and very attractive room in Townshend Hall, the society became very popular as a literary organization thruout the University. It was thot necessary at this time to change the constitution, naming it Townshend Literary Society, and making any student in the University eligible to membership. It

Townshend Agricultural Society. The Editor and Business Manager for the Agricultural Student were elected from the active members of the society, the organization being directly responsible for the publication of the College Magazine.

From April, 1904, until March, 1916, the Agriclutural College had two organizations of students, namely, Townshend Literary Society and



THE AGRICULTURAL SOCIETY HAS HAD A PERMANENT HOME SINCE
THE ERECTION OF TOWNSHEND HALL IN 1898

then became a regular University literary society.

This left the agricultural college without an organization of strictly agricultural men, where purely agricultural topics could be discussed. It was not until 1904 that such an organization was formed. M. F. Miller, '00, now Professor of Soils at the University of Missouri, T. L. Wheeler, '04, now editor of the Indiana Farmers' Guide, and V. H. Davis, '00, now head of the Ohio Bureau of Markets, were instrumental in the formation of the new association, which was called

Townshend Agricultural Society. They differed somewhat in their purpose, but both drew their membership from the agricultural field. It is true that any student in the University was eligible to membership in the Literary Society, but as a rule the majority of members were agricultural students. Rivalry was evident at times between the organizations, neither one being as prosperous as it might have been, had it not been for the divided interest.

On the evening of February 28, 1916, D. P. Evans, ex-'16, suggested to the Literary Society that a movment be

started to merge the two societies. The suggestion was acted upon and on the evening of March 27 1916, a joint meeting of the societies was held. A revised constitution was accepted and the two societies were officially united under the name of Townshend Agricultural Society.

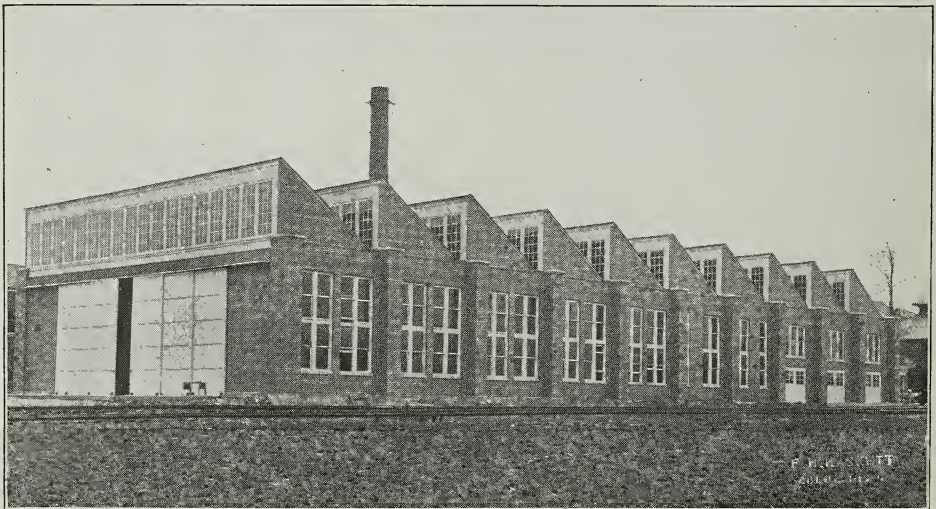
From that date until today our college has had a very prosperous society. It is the only society of its kind in the University that has been able to survive the abnormal conditions of the war. In the history of the University many societies of students have been formed, first to flourish and then to vanish, but Townshend still lives. The loyal support of sixty active members, and the splendid interest and cooperation of the faculty, enable the society to occupy an important place in the college career of agricultural students.

If you would be known and not know,
vegetate in a village.
If you would know and not be known,
live in a city.—*Colton.*

SOIL IMPROVEMENT

(Continued from page 402.)

useful for farm crops work. Of course some modifications have been found necessary when horticultural or some other lines of work were taken up. It is quite difficult to measure results from this work, but we are convinced that, from statements made by men handling fertilizer, that better fertilization is being practiced and the general opinion of the men everywhere is rather optimistic. They feel that the county is growing better crops and, after all, we are inclined to think that the growing of good crops is often largely a matter of ideal. If the thought of better crops is constantly kept in mind by the men, in a short while they will find themselves doing the things necessary to grow better crops. It is hard, of course, to measure in dollars and cents the value of this work, but when we meet, as we often have, such men as Mr. Burdsall, who has been able to do something difficult to do before, we feel that after all perhaps the work is worth while.



This building is the new headquarters of the Department of Agricultural Engineering at Ohio State University. It is also the headquarters of the American Society of Agricultural Engineers since Professor Ives of the department is secretary-treasurer of the Society. The building was constructed as a laboratory for the Aviation School. During the S. A. T. C. period it was used as a mess hall.

THE TREND OF MODERN EDUCATION

By J. L. CLIFTON, Professor of Principles of Education, O. S. U.

MANY friends of education are at the present time much concerned on account of a seeming trend toward vocational and industrial education. This unrest is not confined to university training but reaches down thru the high school into the elementary grades. Boards of Education and Superintendents of schools are trying to meet these new demands without destroying the foundation and purposes of elementary and secondary education. Colleges and universities are battling with the same problem.

Abnormal conditions, wages and prices during the last year have stimulated this feeling of unrest. However, the demands of the Government for academically trained men and women have made plain to all that a foundation in elementary and secondary academic subjects is absolutely necessary for the most successful, serviceable, and happy life. The one situation about offsets the other.

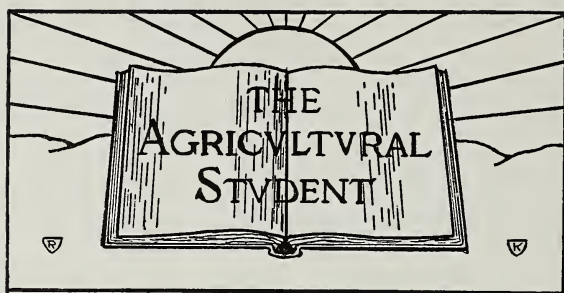
Following a "blind alley" is an expression, much used at the present time, applicable to anyone who allows present gainful occupations or superficial training to detract from fundamental training. All communities are well supplied with such people, who have either from necessity or misjudgment been directed in this line of work. No one has ever accused an academically trained student of following this much abused way. Perhaps the only way to definitely evaluate the academic high school training is to make comparisons between students of equal ability who have and have not taken these academic courses. In practically every instance the student with the academic training gradually leaves far behind the one with the

superficial foundation. Therefore, the high schools, colleges and universities may open their doors to vocational and industrial courses without any danger of destroying the fundamental purposes of these institutions. Doubt is sometimes expressed concerning the efficiency of students who take the foundation academic courses concurrently with their vocational or industrial work. When you compare the recent graduate with the graduate of the last generation such comparison is likely to be unfavorable to the efficiency of the present day school. This is more than accounted for by the twenty years or more of reading and experience of the older person. The graduates of our present day institutions are much better prepared for life than of any previous time.

The hope of vocational and industrial education is not the exclusion but the inclusion of academic and cultural subjects in the curricula. This applies equally in the elementary schools, the high schools, and the universities. We need men and women trained to do a definite work but at the same time whatever the work may be they must be well grounded in the fundamental academic subjects which are given in all our schools. Therefore the trend of modern education toward the vocational and industrial education will not eliminate the academic school but will strengthen and upbuild it.

Should the farmer eat at the city man's second table?

Nature has made occupation a necessity to us: society makes it a duty; habit makes it a pleasure.



OF

OHIO STATE UNIVERSITY

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Published by the Students in the College of Agriculture.

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Assistants to the Editor: C. R. ARNOLD, '19;

G. F. HENNING, '20; H. E. WALTON, '20.

BACK AGAIN

With this issue the agricultural college magazine comes back into the hands of its students. The September and October issues were published by the student staff. The call for men for military service in October so depleted the staff that it was found necessary for the faculty to take charge of the publication. The November, December, January and February numbers were published with Prof. Alfred C. Hottes of the horticultural department as editor and True G. Watson, secretary of the college, as business manager. Due to the desires of Dean Vivian and the excellent work of the faculty staff, THE AGRICULTURAL STUDENT maintained its standard during the acute period of the war. It is the only

magazine of its kind that continued publication thru the war.

WELCOME BACK

Eighty of our former college mates have returned from service to school. Where is the fellow who said that war would change a man's mind so that he never would care to continue his education?

In this issue we have some information showing the capacity in which the returned men served. We regret that we were unable to get information on all the men. The majority have been in military service, although a number are returning from agricultural service. One man said, "I made five futile attempts to get into the army, so did the next best thing, 'back to the

farm.' " Returned men! Let it be known that—whether you were in the army or on the farm; whether you have bars on your shoulders, chevrons on your sleeves, or just the marks of the indispensable private,—THE AGRICULTURAL STUDENT welcomes you.

PREPAREDNESS

During these winter days when very little outside work can be done is a good time to see that all of the machinery and equipment is in good order and ready for spring and summer use. Was the binder in perfect condition when it was put in the shed last fall or did it need some new parts for which only temporary repairs had been made? Do the mower sickles need any new sections or corn planter any new parts? Are you sure that the harness is all ready for use and that you have a few extra single-trees in case one should be broken? These things all take a great deal of valuable time if left until they are needed but can easily be gotten ready now without any loss of time.

THE FARROWING PENS

What about the farrowing pens? Are they ready for those spring pigs? If your sows are large and rather clumsy you no doubt have had some trouble with them lying on the small pigs. A round pole or a two-inch lath nailed on the studding around the wall parallel to the floor and a short distance above it will keep the sow from lying tightly against the wall where the pigs are usually crushed. It should be placed high enough so that the pigs can pass under it but yet not so high that the sow's back will go under. A round pole is most desirable and if a lath is used it is advisable to round off the sharp edges. Some breeders have used a piece of iron pipe for this pur-

pose but this becomes so cold and frosty in zero weather that it is objectionable. Half a day's work now may save enough pigs for next winter's meat.

RURAL LEADERSHIP

There has been a great awakening to the possibilities of rural leadership in Ohio. The demand for men, having the proper training for leadership, for county agents, high school instructors, and rural ministers has increased tremendously. Mr. Vogt in his article in this issue gives some timely thoughts on the part agricultural colleges should play in the training of these men.

College training will broaden the mind, but the essential qualities of a leader are born in him. The man to be a successful leader, must be able to look a backward community squarely in the face, realize it's possibilities, and start out to attain them with dauntless courage. In order to do this he must love rural life and have a deep understanding and acquaintance with it. A man does not need to be a graduate of a school of theology in order to become a leader in this work, for the church has opened it's doors to more liberal ideas, quite largely dismissing the question of creed. A student of any one of our class institutions of higher learning can fit himself for this kind of work, by choosing his courses with this idea in mind.

SPRING USE OF WINTER MANURE

Manure often accumulates during the winter months in sheds, covered barnyards, and feeding lots. With this valuable supply of fertilizer on hand it is to the advantage of the farmer to know just where and how to apply it in order to get the most profit from its use. Many follow the practice of hauling the

spring supply of manure upon the corn ground. The corn plant is a "coarse feeder" and will respond to manure better than most other crops.

Top-dressing the wheat or at least applying the manure to the poor spots in the field is a fair way to utilize it. This application increases the wheat yield and improves the stand of grass seeded in the wheat. Top-dressing the pasture or meadow is another profitable way to use the manure.

In applying the manure it should always be remembered that the most valuable portion of it is in a very soluble form therefore, to secure the maximum benefits from it, applications must be made where the available portion can be taken up immediately by growing crops. A manure spreader is necessary to get the maximum returns from the manure because a thin, even application is essential. Four tons spread over an acre of ground will bring greater returns per ton than when spread over one-half acre, the same crop being grown in each case. Consequently when the supply of manure is limited, a thin application, which can be secured only by the use of a spreader, is the most profitable to make.

A NEW CORN PEST

The European corn-borer has recently appeared in Eastern United States. The insect is known to have damaged at one time fifty per cent of the corn crop in Central Europe. Eggs are laid on all parts of the plant,—tassel, ear, leaf, and stalk. After hatching the larva burrow into the tassel causing it to break off when the wind blows. They damage the ear and weaken the stalk so that it often breaks off. Since the offspring of a single female may number three hundred and

fifteen thousand in one season, it is easy to see what damage they may do.

Besides corn the insect attacks oats, celery, beets, spinach, beans, potatoes, and other crops.

The borer passes the winter in crop residue and dead weeds about the field. Clean farming will aid materially in checking the pest.

FUTURE OF THE DRAFT HORSE

Trucks increased in Chicago four hundred and forty-one per cent in three years. During the same time two-horse teams decreased fifteen per cent and three-horse teams thirty per cent. In New York there were twenty-one hundred less draft horses in 1917 than in 1915.

Is the draft horse doomed? Wayne Dinsmore, Secretary of the Percheron Society of America, says, "There is a limit to the profitable replacement of draft horses by trucks and tractors." Horses are found more economical for short haul work. What then is the limit of profitable replacement? In Chicago there seems to have been reached a limit, and not more than thirty per cent of the draft horses have been replaced.

Tractor competition is a newer development. There is, however, a limit to the profitable replacement, the same as with trucks in the city. A smaller number of horses will be replaced by tractors than by trucks. Such factors as soft ground, lack of skilled mechanics, distance from repairs, and higher cost of gas, oil, and repairs prevent the use of motor power on the farm to the extent that it can be used in the city.

When considering both tractor and truck competition, it is reasonably safe to believe that the future of the draft horse is assured.

WELCOME BACK

Information on the Men who Have Returned to College from Military Service

Kofoid M. Allen, '20, was stationed at Camp Knox, Ky., with the field artillery unit. He was in the service five months.

Carl R. Arnold, '19, served in the chemical warfare branch at Camp Syacuse, N. Y., and later at Philadelphia, Pa.

Watson L. Deaver, '20, and Gilbert M. Boehm, '20, received their ground training in aviation at Kelly Field, Texas. Boehm was later transferred to the Infantry Officers' Training School at Camp Grant, where he received his discharge November 28. Deaver was an aviator in England for eight months.

Albert F. Patterson, '21, Robert H. Hall, '20, Merrit E. Jones, '20, and Harold H. Van Dervort, '21, were in the Infantry Officers' Training School at Camp MacArthur, Texas.

Clarence E. Rowland, '20, has a long military record. He enlisted June 5, 1917, in the infantry, being stationed at Camp Sherman and later at Camp Stanley, Texas, where he was commissioned June 1. He received his discharge at Camp Lee, Va., December 23. Harold G. Kenestrick, '19, was commissioned at Camp Lee, Va., after three months training in the Infantry Officers' Training School.

Edgar D. Lenhart, '20, and John A. Pontius, '21, were non-commissioned officers in the infantry at Camp Sherman. Pontius was later transferred to Camp Pike, Ark., as an instructor in the Non-commissioned Officers' Training School.

C. R. Runk, '19, and Arthur E. Halterman, '19, trained with a machine gun unit at Camp Hancock, Georgia.

Frederick J. Roehll, '19, Homer W.

Walters, '19, and Harold P. Twitchell, '20, received their commissions September 15, after three months in the Artillery Officers' Training School at Camp Taylor, Ky.

John J. Riggle, graduate student, was commissioned in the artillery at Camp Taylor, Ky.

R. W. Gardner, '19, was an infantryman at Camp Dix, N. J.

George F. Henning, '20, and Harold Hukill, '20, were in the engineering branch of the service. Henning was a non-commissioned officer in the Twenty-ninth Regiment.

L. M. Fenner, '19, enlisted in the Fourth Officers' Training School at Camp Custer, Michigan, and later transferred to the Artillery School at Camp Taylor, Ky.

Sanford G. Price, '19, secured his commission in the infantry at Camp Sherman August 26. He was connected with the One Hundred and Fifty-Eighth Depot Brigade.

James A. McCoy, '20, was in the Coast Artillery Corps at Sandy Hook.

Frank R. Kelly, '20, was a naval aviator stationed at Minneapolis, Minn.

E. R. Raymond, '19, was commissioned August 26 at Camp McClellan, Ala.

T. H. Connell, '19, was commissioned at the Artillery Officers' Training School at Camp Taylor.

Wm. H. Rose, special student, was commissioned in the artillery at Camp Taylor. He was later stationed at Camp Jackson, S. C., Camp Sheridan, Ala., and received his discharge at Camp McClellan, Ala.

Mark A. Fuller, '19, was in the Ensign School at Cleveland.

John K. Graham, '19, was in the

navy, stationed at Hampton Roads, Va.

Henry J. Page, '19, was training for an ensign in New York.

The following men were stationed at the Great Lakes Naval Training Station: Thomas G. Allen, '19; George B. Arthur, '19; Orson E. Barker, '19; Paul W. Cromley, '20; Kenneth L. Ewart, '19; Don S. Kochheiser, '19; and David T. Herman, '20.

Harold M. Kidd, '19, assembled aeroplanes at the Dayton plant of the Wright Aeroplane Co. Twenty-five planes was the daily output of the company.

BACK FROM THE FARM

The following men have returned from agricultural service: Byron E. Bricker, '20, Shelby; Bernard M. Durbin, '19, Danville; R. B. Dunn, '19,

Deshler; L. A. Kauffman, '20, Dayton; Samuel A. Porter, '20, Halta; Thomas Reber, '21, Upper Sandusky; Samuel S. Studebaker, '20, Tippecanoe City; Howard R. Waugh, '19, Wood County; W. P. Miller, '19, Sunbury.

Other men who have returned to school this semester are: W. Corcoran, W. H. Craig, D. D. Dowds, J. V. Ekelberry, D. P. Evans, H. W. Frank, C. F. Hearlin, S. H. Harshway, C. A. Henry, Milton High, Foster Hoffman, Frank A. Hoover, R. W. Laughlin, A. F. Leamy, W. J. Lewis, Ralph Lock, J. A. McCalmont, Henry Malten, M. F. Meyers, D. S. Owen, R. O. Raine, Eugene Ryan, M. B. Sanford, R. J. Smylie, E. F. Townshend, G. E. Uncaper, H. E. Walton, E. M. Warren, L. M. Weaver, G. W. Werniche, Albert Baker, R. W. Barr, R. A. Beers, W. H. Bovard, H. R. Brinker, and Harvey Byers.



MORTON HALL—WHERE THE CHIMES RING

Campus Notes

FARM BUREAU FEDERATION

A big forward step was taken in farm bureau work in Ohio when the state federation of the farm bureaus was organized here at Ohio State during Farmers' Week. C. E. Bradfute, Xenia, was elected president; H. P. Miller, Sunbury, vice president; H. C. Rogers, Mechanicsburg, secretary-treasurer. Several states now have state organizations of their county farm bureaus. Extensive programs are being worked out for improving agricultural conditions. The state organization will not seek to replace or compete with other farm organizations. Its purpose is to coordinate all movements for improving rural conditions and solving farm problems. Proposed legislation will be carefully scrutinized and the interest of farmers in the markets will be protected.

In the April issue Mr. Miller will tell our readers about the possibilities of the state federation and the program for the coming year.

WORLD PROBLEMS FORUM

This is the title of a series of lectures being given at the weekly meetings of the Y. M. C. A. The idea is to give students and faculty an opportunity to hear speakers of wide experience on the various reconstruction problems of the day. Among the speakers are Dr. J. G. Vaughn, of China; Fred Rindge, International Industrial Secretary of the Y. M. C. A.; Prof. Henry R. Spencer, of the Department of Political Science; John W. Pontius, City Secretary of the Y. M. C. A.; and C. C. Hatfield, of Chicago. The forum will wind up

by a discussion of a League of Nations by President Thompson.

Luke Cooperrider, '17, who has recently returned from Army Y. M. C. A. work, is now Secretary of the University Y. M. C. A.

INTRA-MURAL ATHLETICS

With the evacuation of the gym by the S. A. T. C. the floor once more became available for athletics, and intra-mural basket ball has been revived. Play started on the evening of February 13 with nine hotly contested games.

Thirty-one teams started the season in one boarding club and four fraternity leagues. The inter-college league composed of seven teams started games in February. The college teams in the field are the Ags, Vets, Mechanicals, Electricians, Chemicals, Pharmacy, Commerce and Journalism. The winners in each league will receive a cup, and at the conclusion of the league schedules an elimination series will be played by the various league champions for the Intra-Mural Championship and a cup offered by Wilson Bros. Sporting Goods Company.

At the open meeting of Townshend Agricultural Society February 10, James A. Howenstine was elected Ag. athletic manager. A squad of twenty men are out for the basket ball team and practice is being held every evening.

NEW EXTENSION WORKER

James B. Greene, of Sellersburg, Indiana, a graduate of Purdue in 1910, has been employed as extension special-

ist in Agricultural Engineering. Since his graduation he has been employed as designing and construction engineer for the Louisville Cement Company of Sellersburg. In connection with this work he managed a fifteen hundred acre farm near Sellersburg.

TOWNSHEND ELECTS OFFICERS

The Annual Second Semester Open Meeting of Townshend Agricultural Society was held Monday, February 10, with seventy-five students present. Dean Vivian gave an interesting talk on the "Opportunities of the Agricultural College Graduate." Mr. McClintock explained the work of the Extension Department.

During the intermission a bushel and a half of "Northern Spies" were eagerly disposed of.

In the business meeting which followed, officers for the second semester were elected as follows:

Carl R. Arnold, '19, President; Geo. A. Dustman, '20, Vice President; Otto J. Smith, '19, Secretary; Vance Clever, '21, Treasurer; Harold G. Kenestrick, '19, Censor.

OHIO'S SOLONS VISIT CAMPUS

The Legislature of Ohio took advantage of Washington's birthday to look over O. S. U. At 11:00 a. m., accompanied by President Thompson and Dean Vivian, the lawmakers stopped long enough at the Animal Husbandry Department to see the livestock.

Libretto, the gray Percheron stallion, led the procession of University horses which were brought into the pavillion. Professor Kays who has charge of the horse work made a few remarks of the breeding of the particular individuals. The Percherons were

followed by the Belgians and they, in turn, by the Shorthorn and Angus cattle. All four of the dairy breeds were shown, and C. T. Conklin told of their records and performance.

President Thompson discussed the urgent need of legislation for a pure bred stallion law in Ohio. He gave as his proof the action of the French government. He told how the government had interest in twenty-two different studs and at the beginning of each breeding season allowed them to be distributed over the country in the hands of competent care takers. By so doing only good pure bred sires are used in promoting the horse population of France. In conclusion he left the suggestion that Ohio is in need of some legislation against the use of mongrel, unbred, and poor scrubby sires. Not until then will the state take a real step forward in horse breeding.

SADDLE AND SIRLOIN REORGANIZED

The Saddle and Sirloin Club, which has held no meeting for more than a year, was revived by the old members and other students interested in Animal Husbandry at a meeting held on February 19. Prof. Chas. S. Plumb addressed the meeting. Chas. H. Sprague, '19, was elected President, Robert H. Hall, Vice President, and Geo. B. Arthur, '19, Secretary-Treasurer. The Society expects to hold a horse show this spring.

REDECORATING LOBBY OF OHIO UNION

Work was started recently to put a new dress on the Ohio Union lobby. The walls are being repainted, the floors smoothed and oiled, and new lights installed. The ceiling glow type of lights are to be used. Inscriptions

will be written in the spaces within the arches above the panels. These are the first improvements made in the Ohio Union since its completion in 1909.

FOOD PRODUCTS INSPECTION

Columbus has been designated as a Central Market open to Food Products Inspection and a Government Inspector has been stationed in the city.

The law covering Food Products Inspection includes the following points:

First. The Inspectors are given authority to certify to the quality and condition of fresh fruits and vegetables, when proper application is made for such inspections.

Second. Shippers, or their duly authorized agents, receivers or carriers, or any one having a financial interest in the products, are given the right to apply for inspections. Applications may be made verbally, but if so, confirmation of such requests must be made by letter or telegram, before the certificate of inspection is issued.

MILITARY DRILL

Military activities on the campus have been resumed. Since the demobilization of the S. A. T. C. there has been no military work at the University. There are now nine hundred and seventy-two men in the two regiments, recently organized. Men who have been in military service for some time are given credit for drill. Members of the Naval Reserve and those commissioned in the Officers' Reserve are allowed credit.

Lieutenant-Colonel Charles F. Leonard is the new military commandant at the University. He has trained student units at various large military schools. His experiences as a soldier includes service in the Spanish-American War, the Phillipine uprising, and in France

in the World War. The new commandant stated that the program of his department would be such as to not only train the students in military tactics, but one which will increase the personal efficiency of every man.

Captain Griffin Halstead is assistant to Colonel Leonard. He has been in service in France.

NATIONAL FARM BUREAU CONFERENCE

A national conference of farm bureaus was held recently at Ithaca, New York. Clark S. Wheeler, director of agricultural extension, C. E. Bradfute, president of the Ohio Farm Bureau Federation, and O. M. Johnson, state leader of county agents, were the representatives from Ohio. The purpose of the conference was to discuss plans for the formation of a national federation of farm bureaus.

FEDERAL FARM LOANS

During the month of January, \$11,310,920 were loaned to three thousand eight hundred and eighty farmers of the United States by the Federal Land Banks. The Louisville bank from which Ohio farmers secure their money, loaned \$753,000 to two hundred and twenty-one farmers. The grand total of federal loans to February 1 is \$168,213,931 to seventy-one thousand two hundred and four farmers.

Whoever makes two ears of corn or two blades of grass grow where only one grew before, does more essential service to his country than the whole race of politicians put together.—*Swift*.

Better get up late and be wide awake than to get up early and be asleep all day.

VOCATIONAL AGRICULTURE

RURAL EDUCATION

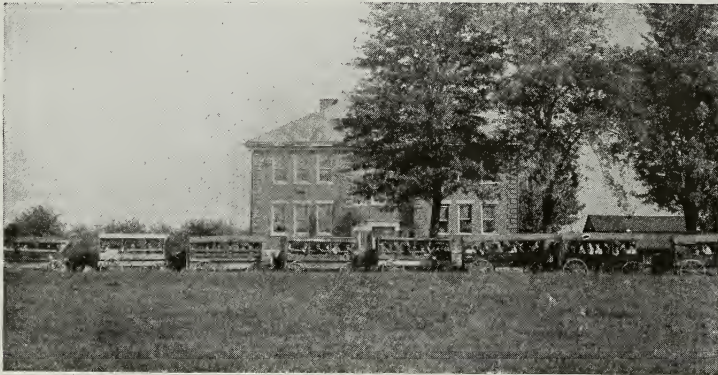
By ALFRED VIVIAN, Dean of the College of Agriculture

AN intelligent rural class is the only safeguard of democracy. A great many persons fear we are tending toward a peasant class in America. The only way to avoid having such a class is to provide good country schools.

The greatest agricultural problem is to turn the faces of farm boys toward the farm and away from the city. We are running the risk of losing from the

minded teachers should be employed. Textbooks should be used that point toward farms and farm homes. The best literature is that which is written about farm subjects. Arithmetics in use in the country should deal with problems in farm figures as to weights, measures, capacity of silos, and number of drain tile to the rod.

Nature study should be taught from



TOWNSHIP SCHOOLS NEED RURAL-MINDED TEACHERS

farms the boys and girls of the highest intelligence.

The main trouble is in the attitude of the country people themselves toward country life. So long as the fathers and mothers feel as they do, the sons and daughters will go to the city. We must create in the country a pride in farming as an occupation. The only way to do is to counteract influences that drive the boys and girls from the farms to the cities.

Our whole system of rural education is at fault. It was devised to meet city conditions. Country schools are taught by city bred and city trained teachers. The rural school system should be changed from the ground up. Country-

the first grade on. Beginning of real agricultural courses should be made in the seventh and eighth grades. By the joint effort of the United States Department of Agriculture, the college of agriculture of Ohio State University, and F. B. Pearson, a textbook for teaching agriculture to seventh and eighth grade pupils is soon to be published. There ought to be at the four corners in every township in Ohio a school, a church, a grange hall, and another community institution, with a man in the high school training the boys in agriculture twelve months in the year and a woman training the girls in home making twelve months in the year.

SECONDARY AGRICULTURAL INSTRUCTOR— HIS SERVICE TO THE COMMUNITY

By S. L. RUDELL

(Mr. Ruddell is teaching agriculture, under the provisions of the Smith Hughes Law, at McConnelsville High School.)

THE man who is placed in a community as a trained agriculturist, under the provisions of the vocational agricultural law, has a wonderful field for service. He teaches the boys in the class room, he supervises the projects on their home farms, and he assists the farmers in solving their individual problems and in improving their farm conditions. The latter phase of his work is popularly known as community service.

The real test of a man in Smith-Hughes work is his degree of success in the various community activities. Personality, at this point counts for a great deal. He must be able to analyze and understand people, and tact is just as indispensable as a ready comprehension of human nature. He should be careful in exhibiting a superior knowledge upon questions submitted to him. This additional knowledge should be available, but to exhibit it in too prominent a manner is apt to create a bad impression.

The agriculturist who locates in a county which has no county agent, has unlimited opportunities for service. The field of operations, however, generally speaking, should be limited to the territory from which the school draws its pupils. In case there is no county agent to work with, the local leader should cooperate directly with the extension department. However, the majority of counties in Ohio, at the present time, have county agents. The local agriculturist should know the program of the county agent, and the latter should assist the former in formulating an effective local program. A

close cooperation between the county and local leaders is essential for effective community work.

The agriculturist should never overlook an opportunity to serve his community unless it interferes seriously with his work in the classroom. The farmer should be made to feel free to visit him at all times. His office and classroom should be "Service stations" where farm problems can be threshed out and where doubtful farm practices can be discussed pro and con.

Many discouraging conditions on the farm are tolerated because the farmer thinks that he has not the time to find the desired information. With an agricultural trained man in the community, the difficulty is removed. Valuable suggestions and information can be secured over the telephone or by coming to the office. It is true that many questions will come up which the trained man cannot answer, but he can put the farmer in touch with men who can.

The agriculturist should have the members of his community understand that his library of useful books and bulletins are at their disposal. His records of farm problem solutions should prove interesting and helpful. A card index filing box, properly kept, serves a valuable purpose in that it puts at the finger-tips at a moment's notice, the desired information concerning many common farm problems. This immediate service is desirable, for the farmer is a busy man. However, the local leader must not be too hasty in drawing conclusions or giving out information and advice. Farm problems

(Continued on page 432.)

Home Economics Department

IS THE AMERICAN HOME A FAILURE?

By LOIS LAMPE, '19

(Miss Lampe gives an economic explanation for the movement from home to institutional living.)

IT is a well established fact that at the present time the trend is leading away from individual housekeeping to living in institutions where the family is a part of a larger group. Already many people have moved from the home to the hotel, and there are varying stages between these two ways of living.

Why does this condition exist? Let us search for an economic explanation of it.

Before division of labor had fairly begun, the home was the center of industry. Economically as well as socially the family was a unit. All its members worked together to provide good clothing and shelter; and the processes of production, manufacture and consumption were completed in the home.

At this time women were engaged in productive labor. Food, produced by the members of the family, was preserved, prepared and served in the home. By them, yarns were spun, and woven into cloth, and the cloth was made into garments. The economic value of woman was apparent, for if a man had no wife or female dependent, then he must either pay someone else to do these things for him, or do without.

With the introduction of power machinery, a change came. Little by little industry was taken from the home. The many processes between production and consumption were separated, and manufacturing was done on a large scale. Men found production in this

manner easier, cheaper, and more profitable.

But during this time, what had been taken into the home to fill the place of the industries which had been taken away? The answer is nothing. Woman as a producer ceased to be, she became a consumer. To a large extent, she bought prepared foods at the groceries and bakeries, and clothing and house furnishings ready made at the various retail stores.

The results of this change were soon seen. The man out in industry earned money to support the family; the woman spent it for their needs. Now the children in the family, both sons and daughters, could no longer help support themselves by working at home. Industry had been taken away, and with it the demand for productive labor. The outcome was a transfer from the home into industry.

Now only the housewife was left in the home and, since the work, though changed in character, did not decrease in proportion to the workers, there was often more than she could do. Furthermore, it was of such a nature that she derived little pleasure from doing it. At the end of the day, there was scarcely anything permanent to show for her labor, for it will be remembered that production had practically been removed from the home. The result of this was two fold: first, discontent on the part of the housewife, and second, stationary low wages for domestic service.

The servant problem became more and more acute. The wages of woman in industry became greater than what they could earn by doing housework, and the working conditions were more satisfactory. This drew all the women seeking gainful occupation into industry, and the demand for domestic service had to be supplied from those classes which could not be utilized there.

Household service was and still is despised, because of the long binding

improvement in the home seemed to be an investment from which there were no returns. The house remained poorly equipped and arranged and, because of this and lack of training on the part of the housekeeper, badly managed. In many cases it was run at an actual loss.

With the growth of industry, the population had become grouped to a large extent in cities. It was found that living in larger units than families,



HOME ECONOMICS BUILDING—OHIO STATE UNIVERSITY

hours, low pay, lack of advancement, and privileges and a certain stigma which has been associated with the household employee. The main reason for this is that neither housekeeping nor domestic service is yet placed on the level of a profession. Training has not been considered necessary and wages for it have not risen in proportion to that in other forms of work.

Furthermore, while science and invention was advancing industry, the household as an economic unit stood still. Woman was no longer a producer, and

cost less than maintaining individual homes. This had to further cooperation in ways of living as well as in industry. Hotels were extensively built and maintained. These were so managed and equipped that they could be run at less cost to the individual than the poorly managed and equipped home. This gave the housewife the opportunity to enter industry or take up a profession without foregoing the associations of family life. She obtained greater freedom and exchanged money for service.

Furthermore, there was a saving of investment by the family as a unit in time, labor and money. Where there was temporary need of a home, it was economy in every way to live in a hotel rather than set up housekeeping. In many cases also, it was found to be cheaper even for a continuous period. Often there is great waste in time, energy, and money in the average American home through inefficiency. It is easier and cheaper to hire efficient and well paid specialists to organize and do the work for many. This eliminates waste which necessarily comes through the maintenance of small groups, and puts the organization and doing of the work into trained hands.

Thus we see that there is an economic foundation for the movement from the home to institutional living. The prime causes for this change may be summarized as follows: Production has been removed from the home into industry. This has led to discontent on the part of the housewife, and stationary low wages for domestic service. Efficient household employees are very few, because domestic service has not been put on the basis of a profession, and the household as an industrial unit lacks equipment, efficient arrangement, and management. Grouping of population in cities has made living in institutions possible, and it has been found that this method of living results in a saving of time, labor and money.

Diner—"Look here! Isn't that a hair in the butter?"

Waiter—"Yes, sir, a cow's hair. We always serve one with the butter to show that it isn't oleo."—*Michigan Farmer*.

Nothing is so expensive as cheap seed.

RESULTS OF ASSOCIATION ELECTIONS

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 Secretary—R. B. Cruckshank, Columbus.
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 Treasurer—F. C. Bearce, Chillicothe.



“HOUSEWIFERY,” by Lydia Ray Balderstna, Philadelphia, Pa. J. B. Lippincott Company. \$2.00.

“Housewifery” is the survey of the management, equipment, and arrangement in the modern household. Its many problems are given brief but exact treatment. The science and art of housekeeping has been emphasized, but the scope of the books does not permit a detailed scientific discussion of the materials and processes involved.

To use the words of the author, the aim of the book is to “show how to reduce tasks in the home, and how to save time, money, and energy.” It is designed to be of “direct help to the many women who do their own work, or supervise household employees,” and as a “text for study groups in rural extension, women’s clubs and housekeepers’ courses given in schools and colleges.

Emphasis is laid on the technical processes of the home and the doing of the greatest amount of work with the least possible cost for equipment, and expenditure of energy. For this reason the book includes many home-made devices which substitute for more expensive equipment. It is left to the reader to judge what is best suited to his own particular circumstances.

The topics treated in the books, include household management, plumbing, heating, lighting, labor-saving devices, household furnishings, cleaning and supplies, storage and household pests. This is supplemented by an outlined course in housekeeping with the necessary equipment, and method of presentation.

“Housewifery” gives complete lists of equip-

ment necessary in the modern home, and can be used as a guide to choose in buying.

Advantages and disadvantages in the various types of appliances are given which is a great aid in selecting to suit different environmental circumstances. The principles employed in the installation of plumbing, heating and lighting, are included in the discussion of these topics. This is of especial value where such equipment is being installed. This book gives the housewife the opportunity to know what there is to be had, before she decides what to have.

The book is not technical in expression, but is written in a simple, clear style. The many illustrations are very helpful in explaining the various methods of working, and types of equipment discussed.

“Housewifery” is a book of practical value to the woman in the home, and to the woman doing professional work in Household Economics. It not only presents the various problems related to the management, equipment, and arrangement peculiar to the household, but it aids the readers in their solution.

LOIS LAMPE, '19.

SCIENCE OF PLANT LIFE, E. N. Transeau, Professor of Botany, Ohio State University, World Science Series. Cloth. Illustrated. 336 pages. Price, \$1.48. World Book Company.

This book was prepared for a botany text for high school use. The fundamental aim of the text is to give the pupil an understanding of the plant as it lives. Six chapters are devoted to the vital processes of the plant. The manufacture, digestion, transfer, storage, and utilization of food are each given a chapter's consideration. A study is made of the structures and processes of stems and roots of plants. Environmental factors are considered in such a way that they help to make clear the reason for certain agricultural practices. Reproduction of flowering plants and their relation to agriculture is given two chapters' consideration.

At the close of each chapter there are suggestions for laboratory and field work followed by practical farm problems. The book is well illustrated. The style is neat and attractive.

Besides being used for a botany text, for which it appears to be well suited, it might be used for beginning work in farm crops in the agricultural department. G. F. J.

AUTOMOBILE REPAIRING MADE EASY.

Victor W. Page, M. E. Norman W. Henley Publishing Company, New York, 1919. 1050 pages, 500 plates. Price, \$3.00.

This book deals as its title indicates with the repairing of automobiles, motors and accessories. While the intention of the book seems to be that of a garage or repair shop handbook, the average owner who makes his own repairs will find much of value. The author deals largely with principles rather than with special types of modern motors, as some of the motor types illustrated are now obsolete. Many useful shop hints are given as well as tables of data for convenient use. Of particular value to the layman is the discussion on the care and repair of tires, as a careful reading of this portion of the work will do much to help the driver in getting more mileage from his tires.

Various shop processes are carefully covered, such as welding, brazing, soldering, etc. Descriptions of tools used in repair work are quite complete.

F. W. IVES.

**Secondary Agricultural Instructor—
His Service to the Community**
(Carried from page 427.)

are more difficult to solve than most other type of problems because conditions are variable and must be determined anew in each individual case. The problem must be studied from all sides before a solution or any definite advice is given.

The local leader should never miss the opportunities for service afforded by the grange, farmers' institutes, county fairs and the Sunday school. He should be an active member of the Farm Bureau.

These various activities offer excellent opportunities for getting better acquainted with the people of the community and learning their individual conditions and problems. With so many opportunities at hand and so vast a field in which to work, the vocational man's program should never be con-

sidered complete until a well outlined plan of community activities is included. He should always strive to extend his service beyond the class room.

ECONOMICAL STOCK FEEDING

(Carried from page 407.)

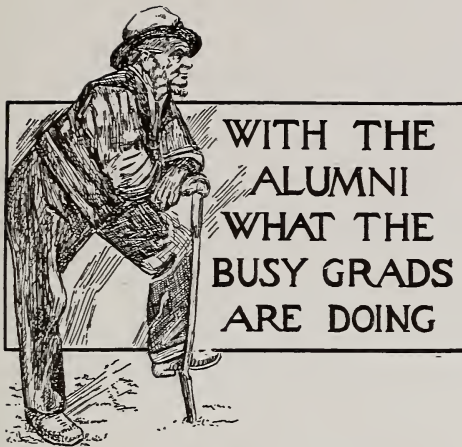
cottonseed meal can not be safely fed to hogs.

With all the data and experimental results at hand the feeder may fail in results unless he is a close observer and adapts his ration individually to his animals. Experimental data are the result of averages, and while of inestimable value one can not apply them to the exclusion of individual tastes. Palatability is as important in a feed as any other item, and animals vary greatly in their likes and dislikes.

OHIO ONION DISEASES

Because onion diseases cause an enormous loss in Ohio, growers are urged by specialists in plant pathology at the Ohio Experiment Station to give attention to the treatment of onion seed used in planting the spring crop. Smudge, smut, black mold and neck rot of onions have been controlled in experimental tests at the Ohio Station by treating the seed with a solution of formaldehyde, made at the rate of one ounce of formalin to two gallons of water. The seed is soaked in this solution for an hour or more but dried completely before planting.

Where onions are grown on the same soil year after year, however, the diseases are found to exist in the soil; while the treated seed produces more healthy onions in the infected soil, specialists recommend crop rotation to rid infested ground. In some cases a regular farm crop is grown in place of the onions thus keeping out the disease because its host plant has been removed.



Luke Cooperrider, '17, is secretary of the University Y. M. C. A. During the war he was engaged in army Y. M. C. A. work.

Walter H. Pomerene, '17, is managing a large farm near Logan, Ohio.

Dana G. Coe, '17, recently discharged from chemical warfare service, is employed in the government nitrate plant at Sheffield, Alabama.

Olen J. Shong, '18, has charge of Boys' and Girls' Clubs in Auglaize County.

Herbert R. John '17, is farming near London, Ohio.

I. P. Lewis, '17, is assistant horticulturist at the Ohio Experiment Station.

Harry A. Marsh, '11, is farming near Amlin, Ohio.

B. B. Fulton, '12, is connected with the New York Agricultural Experiment Station at Geneva.

Ralph B. Rothacker, '18, has been in the medical corps stationed at General Hospital No. 9, Lakewood, New Jersey.

Lowell A. Sutermeister, '18, is bacteriologist with the Chillicothe Bottling Company at Chillicothe.

C. H. Moss, '15, is farming at Worthington, Ohio.

Paul L. Sharritt, '14, is county agent of Miami County, with headquarters at Troy.

H. P. Dutton, '07, is a dairyman at Hockingport, Ohio.

Alva H. Benton, '12, formerly professor of farm management at the Minnesota Agricultural College, is now in charge of the rural economics department at the Manitoba Agricultural College, Winnipeg, Canada.

Ralph Routsong, '15, is farming near Dayton.

Charles G. Carpenter, '14, who has been with the bureau of crop estimates at Washington, D. C., is now doing work for the Department on the Pacific coast, with headquarters at Portland, Oregon.

Harry O. Stout, '15, is teaching commercial work in the Fremont High School.

R. C. Spilker, ex-'20, is farming at Perryburg, Ohio.

W. G. Weiler, ex-'20, is helping on the home farm at Fremont. He recently started a herd of Aberdeen Angus cattle.

Thomas L. Guyton, M. Sc. '16, is scientific assistant in the bureau of zoology, department of agriculture, Harrisburg, Pa.

B. S. Cole, '17, is district club leader at the Somona Valley Union High School, Somona, California.

J. W. Stratton. '17, is in the banking business at Piketon, Ohio.

Richard C. Fisher, '18, recently returned from oversea and is now engaged in bacteriological work in New York City.

Ralph Richardson, '18, has charge of the agricultural department in the St. Clairsville High School.

Delmer C. Jobe, '18, is in the sheep business at Cedarville.

Arthur S. Clark, '18, is oversea in the One Hundred and Fifty-third Ambulance Company of the Seventh Army Corps. In a letter from Bruch bei Wittlich dated January 20, he writes, "The landscape here does not need to apologize to the Ross and Pike County hills for the hills here are at least as high and more numerous. We spent yesterday in going up to Verdun thru the battlefields. Verdun is wrecked but not leveled to the ground. The hills around Verdun are full of dugouts and

shell holes and down beyond St. Mihiel there are trenches after trenches filled with barbed wire entanglement."

C. P. Lang, '18, is a lieutenant in a reconstruction unit in France.

O. E. Herring, '19, is the Smith-Hughes agricultural instructor in the Cadiz High School.

Samuel B. Guard, '12, associate editor of the Breeders' Gazette, gave two addresses to the short course students at Ohio State during the week of February 17.

YEARS



AGO

NEWS FIVE YEARS OLD

The Animal Husbandry Department recently purchased Dope, a black Percheron filly, from C. F. Camp, Homersville, Ohio.

The Percheron horse breeders of Delaware County have organized an association called the Delaware County Percheron Breeders' Association.

M. O. Bugby, '05, was recently appointed county agent of Trumbull County.

A census of the freshmen class in the Agriculture College showed that fifty-five per cent of the men came from farms, and the remainder from cities representing forty different occupations.

The Agriculture College faculty has adopted requirements for actual farm experience before a degree is given in agriculture. The increasing number of city farmers taking the agricultural course is the reason for making this requirement.

WHAT OTHERS SAY

About the "STUDENT"

The following are a few selections from our circulation files :

From a Farmer:

"I receive much pleasure and profit from the "Student," especially articles from my old Professors.

"I also find great interest in the Alumni news."

L. R. FREDERICK,
Wadsworth, O.

Edwin Bates, Instructor Perry Co. Model Rural School, Junction City, O., says:

"I like to have it on the reading table of the school."

G. F. Aldrich, State Institute speaker, Helena, Ohio, writes:

"I have received the December number of 'The Agricultural Student' and am delighted with its contents. I think you have entered a good field and gathered a lot of good things for your Christmas number."

One from Michigan:

"It may seem strange that an old farmer in Michigan should subscribe to the Student, but I certainly enjoy looking it over and find much of real value in its varied articles. Then it carries memory back to the time of National Corn Shows at the Ohio State."

L. L. LAWRENCE,
Decatur, Mich.

*Are You Getting These Good Articles and
the Ohio State News?*

**NOW IS THE TIME TO SUBSCRIBE
FOR THE AGRICULTURAL STUDENT**

Sign the following coupon and mail to The Agricultural Student, Columbus, Ohio:

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Gentlemen:—Enclosed find \$.....for which you will please
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Year \$1.00 With
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Ask us for prices on
Books or Magazines.

THE STUDENT One
Year With
The National Stockman
and Farmer, \$1.50.
The Indiana Farmers'
Guide, \$1.50.
Hoard's Dairyman, \$1.75

Please mention THE AGRICULTURAL STUDENT when writing advertisers.

THE CARE OF THE FLOCK

By C. L. HARDIN, Ex-'20

THE correct time to begin to care properly for the young stock is before they are born. The time of birth is somewhat determined by the time of marketing or by the use for which they are intended. Ewes should be carefully looked after and proper exercise and feed given them before lambing. The time of lambing somewhat governs the care to be given the lambs at birth. If

especially the first six months after birth. Experiments show that the average gain on lambs properly cared for was five pounds per head per week. The hay, grain, or other feed consumed by young lambs is well paid for. By pushing lambs slightly they can be sold in two or three months at as much as if they were kept till fall. It is the scarcity at the early part of the season that



WARM QUARTERS SHOULD BE PROVIDED IN COLD WEATHER

cold weather prevails warm and comfortable quarters should be provided. Care should be taken not to allow young lambs to become chilled at birth.

The outcome and development of the flock depends largely upon the care the lambs get, the first year. If lambs are stunted, then, they will always remain stunted and never make the proper growth. Lambs should be kept in small groups in the barn with their mothers, after they have been removed from the lambing pens. Over-crowding is to be avoided.

Lambs make most rapid and economical gains during their first year and

causes the market to be good. This extra feeding has two advantages.

At this time it might be well to mention the right kind of equipment for feeding. A creep should be made whereby the lambs are able to get to the feed and the ewes are kept away. Inside this creep should be placed troughs and racks of the proper style so as to save feed and also be convenient for the lambs. Flat bottom troughs should be used and a board placed lengthwise of the troughs so the lambs cannot get their feet in the feed and waste it.

A good ration for early in the year

(Continued on page 442.)

What Do These Heaps Mean

THEY represent the difference there is in the digestibility of different feeds. They illustrate the milk-producing value of Buffalo Corn Gluten Feed, with its high average of 1614 digestible pounds to the ton, compared with another feed which runs relatively low in digestibility.



They are intended to impress upon you how important a thing the digestibility of feed is—to emphasize the fact that the cow can make milk from only that part of her feed which she can digest, and can make none from the part she cannot digest.

All dairymen appreciate the importance of this point of high digestibility. But too many men, usually those who can least afford not to get the most for their money, overlook it when they buy feed.

Put your feeding on a digestibility basis. Feed highly digestible Buffalo Corn Gluten Feed, and get more milk. Write today for samples, feeding formulas, and particulars.

Corn Products Refining Company

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Heaps of Difference

**BUFFALO
CORN
GLUTEN FEED**

1614 DIGESTIBLE POUNDS TO THE TON

THE DIGESTIBLE PART OF
A FEED LOW IN DIGESTIBILITY

SPRING BULLETINS READY

Bulletins ready for distribution to Ohio farmers as announced by the Ohio Experiment Station, Wooster, include: "Corn Experiments," "Fertilizers for Tobacco," "Liming the Land," "Clover vs. Alfalfa for Milk Production" and "Livestock vs. Grain Farming." Any of these bulletins are mailed to Ohio residents on request.

VALUE OF FARM WOODLOT

Prices of farm land in various parts of Ohio are being determined partly by the value of the standing timber on the tracts as found by the department of forestry at the Ohio Experiment Station. In a number of cases the value of the timber has been estimated by foresters, then the final price is put on the acres by the owner when the actual worth of the trees is known. Service in estimating is given without cost to farmers upon request by the forestry officials of the Experiment Station, Wooster.

Due to the varying uses and prices of timber, the actual worth of a tract may be determined only after a thorough estimation. Some of the hardwoods may be sawed into finishing lumber but a lower quality of timber may produce only bridge plank, railroad ties or common bill stuff. The kind of timber also affects the final value of the entire timber tract as black gum, hornbeam, blue beech, buckeye and willow generally are less valuable than the oaks. Distance from market and transportation conditions also figure in the estimates.

Pruning time is here. Spraying time is coming. Prepare for it.

America—half brother of the world.
—*Bailey*.

A VALUABLE LEGUME CROP

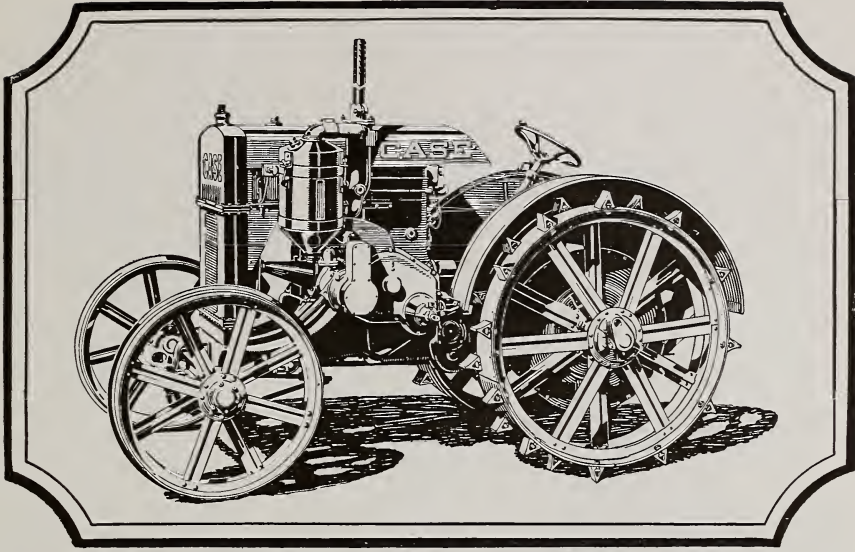
The soybean as a legume crop deserves a much wider recognition than it has yet received, according to specialists in soil fertility at the Ohio Experiment Station. This is based particularly upon the ability of the crop to produce large amounts of feeding nutrients, as a twenty-bushel crop of soybeans will carry forty per cent more protein and twenty-five per cent more fat than a fifty-bushel corn crop, or thirty per cent more protein and sixty-five per cent more fat than a two-ton crop of clover hay.

Ton for ton, soybean hay and alfalfa hay contain practically the same quantities each of protein, carbohydrates and fat, and the oilmeal from soybeans is higher in these nutrients than that from cottonseed or linseed, feeding experts state.

Soybeans have practically the same climatic and seasonal range as corn and both may be converted into silage together.



SOYBEANS SHOULD BE USED MORE IN
THE FOUR-YEAR ROTATION



A New Case Kerosene Tractor

ABOVE we picture the new Case 10-18, our latest introduction. This, we feel, is the most advanced of all, embodying, as it does, numerous latter-day improvements.

For instance, it is the first offered with a one-piece main frame with a four-cylinder motor mounted cross-wise. All cut steel spur gears, enclosed and run in oil. We could name a dozen new features like these showing the advanced engineering.

This tractor, while rated 10 horsepower on the drawbar, actually develops 13 to 14 horsepower for emergencies. At 10 horsepower it delivers 1,666 pounds pull, more than enough ordinarily for a two-bottom plow going 7 or 8 inches deep. And there is plenty of reserve for the hard pulls.

On the belt it can deliver from 23 to 24 horsepower when necessary. This 10-18

will readily drive a 20x28 Case Thresher with all attachments.

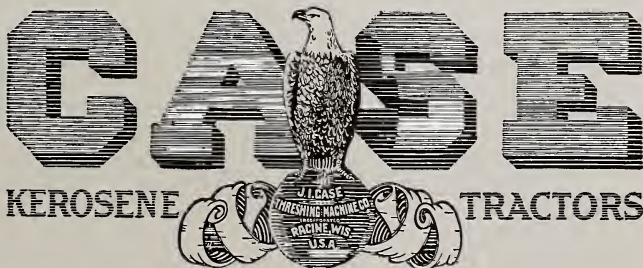
For all kinds of drawbar and belt work, this sturdy little tractor is the most powerful and consistent performer yet built.

All the details are described in our illustrated booklet, which will be sent free, upon request. It will acquaint you with the latest in tractors.

J. I. Case Threshing Machine Company, Inc.

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(792)

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BIG YEAR AHEAD FOR BEE-KEEPERS

According to predictions made by the Department of Agriculture at Washington, the bee-keeper may look forward confidently to a prosperous season during the coming summer and fall. The department reports that the increase in the cost of honey, owing to the big export demand created by the war, makes it safe to predict that the coming year will see the greatest effort ever made to further bee-keeping.

During the last half of 1918, honey to the value of \$2,000,000 was exported. This was about ten times the valuation for any year before the beginning of the war, which indicates that honey has ceased to be a luxury in the minds of the allied peoples. The home demand for honey has also increased.

Delaine Merino Sheep, B & C Types

The Big Ones Bred for Wool and Mutton

FRANK H. RUSSELL

Rural Delivery No. 3, Wakeman, Ohio.

Wanted—

Salesmen to sell dairy barn equipment. Experience in selling desirable but not absolutely essential. Experience in dairy farming an asset. Positions in other departments of our business open from time to time. When applying, state age, married or single, references, past experience, in first letter. Address

**James Manufacturing
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Fort Atkinson, Wis.

PLOW EARLY FOR CORN

Most farmers realize that in preparing land for corn the earlier the land can be plowed in the spring the better. There are, of course, exceptional years when very early plowing is not desirable, but these exceptions are rare. Consequently it is generally wise practice to plow the land as early as possible. The fact that many farmers fail to get this done is not so much because they do not believe in early plowing as it is because of a failure to organize their work properly. Of course, there are seasons when no man can plow early, but again it may be said that these seasons are rare.

Early plowing makes possible a good seed bed. The soil is given time to settle together below, which is a very important principle, the weeds are held back and the farmer has more time in which to prepare a thorough pulverized surface. Late plowing means either clods or the necessity of turning under a large growth of weeds too late for its proper decay. Usually it means both of these things and the impossibility of preparing a good seed bed.

The only cases where early plowing is not desirable are in those seasons and on those soils in which the land runs together after plowing. A soil lacking in organic matter may readily be beaten down by spring rains after it is plowed, so that it becomes very hard. On the average soil, however, such a condition is not to be expected and the early plowing means a much better seed bed than can possibly be prepared where the plowing is done late.

It is better to wear out than rust out.
—Cumberland.

**Send
Your Corn
To
Market**



GRAINS are in urgent demand for human consumption. It is the patriotic duty of stock raisers, especially dairy farmers, to use mixed feeds—and it has been proved that such feeds when correctly made are more profitable. For instance, the fact that International Feeds are finely ground insures use of every fat and food particle, while forty percent of whole grain feed alone is wasted. It's far more profitable as well as patriotic to sell your grain.

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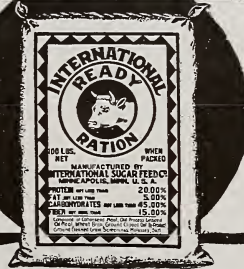


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This is a ration mixed for you at the International Mills—two of the biggest feed mills in the world. It's the result of years of research by feed specialists. It is delivered to you containing just the right percentage of fats, carbohydrates and protein. It is far better than the usual home mixed feed. Naturally, it produces the maximum milk flow. An increase is guaranteed. Those whose dealers do not have International Ready Ration are requested to send their orders to the

INTERNATIONAL SUGAR FEED CO.
Minneapolis Minnesota

Also makers of International Special Dairy Feed, the world-famous mixing feed for cows.



INCREASED PROFIT

is the ultimate aim of the dairyman. This increased profit depends on the quality and quantity of the milk product produced and the cost of production.

To insure the highest quality dairy products it is essential that everything in the dairy is in the most sanitary and cleanly condition.

With the aid of

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Cleaner and Cleanser

your dairy can easily be kept in this most sanitary and healthy condition. Its use assures you that your separators, milk cans, churns and other milk utensils are thoroughly clean, because it removes all sourness, odors and objectionable matter that is the cause of inferior quality by making them sweet, clean and sanitary.

As an economy this material should greatly reduce your cleaning expense.

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In every
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SEVENTEEN-YEAR LOCUSTS ARE COMING

One of the greatest broods of the periodical cicada, commonly called the seventeen-year locust, will appear over the western half of Ohio during May and June, according to entomologists at the Ohio Experiment Station. The previous brood was recorded in 1902 by the United States Department of Agriculture, the insects being of the same species as the brood that appeared over the eastern part of Ohio in 1914.

Since the insects attack young trees particularly, orchard owners are advised by entomologists not to prune small trees this spring in the sections where the locusts will appear. The chief damage done by the cicadas consists in incisions made in the twigs of trees by the females for egg laying. A young, pruned tree will not stand the attacks as effectively as the unpruned tree.

THE CARE OF THE FLOCK

(Continued from page 436.)

consists of two pounds of wheat bran, one pound of crushed oats, one pound of finely ground corn meal, and one-half pound of oil meal. Later in the year the amount of corn meal may be reduced and the amount of oats increased. Fine second crop clover or alfalfa hay will furnish the best roughage for young lambs. Roots are also good, if available.

It is a good idea to move the creep to the pastures where the lambs can have access to the grain along with the green feed. It has been found that this works very well and great advantages have been derived therefrom. If lambs are well fed during the first year one can expect a well developed flock. There is no danger of getting them too fat, either for breeding purposes or for the butcher, if an excessive use of fattening grains is avoided. When well fed they

MERIDEL FARM DUROCS

The Popular Kind.

MERIDEL FARM, BLACK LICK, OHIO

Where Good Sows and Good Boars Meet

On East Broad Street, 9 Miles East of Columbus.

2 Miles from Black Lick.

3 Miles from Reynoldsburg.



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Both farm and city property owners need to know the absolute safety and service of metal roofing.

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grow so much that they do not lay on any surplus fat.

Lambs may be raised on cow's milk successfully if proper precautions are taken. People have the idea that cow's milk is too rich for lambs. This is a false idea, proven to be untrue by an experiment on a grade Dorset ewe whose milk tested fourteen and four-tenths per cent fat. This, however, is better than the average ewe. There are certain things to keep in mind when using cow's milk. First, use milk from a high testing cow. Second, use milk from this same cow all the time. Third, feed the lambs every two or three hours for the first few days and nights and a small amount at each feeding, probably two or three tablespoonfuls with a gradual increase. Fourth, the milk should be warmed up to ninety-two degrees Fahrenheit, which is about the temperature of sheep's milk. Do not boil milk as this causes constipation. Fifth, the bottle and nipple should be kept clean. Raising lambs by hand is not very profitable and only good individuals are worthy of the trouble.

Lambs should be marked the first or second day after birth to avoid any mistake that might arise later on. This is necessary for registration of the purebreds. The Dana Ear Label is proving quite a success, but when using it care must be taken so as not to cut a vein in the ear when putting the label on. Another way to mark them is to tatoo their ears, but this is not quite as good as the ear label.

Lambs should be castrated at from one to two weeks old. Only the ones left for breeding purposes should be exempted. Buck lambs do not sell nearly so well on the market as castrated lambs, and a little time spent when they are a couple of weeks old will be amply paid for in the higher market price.

Students May Readily Inform Themselves

as to the Productive Characteristics of the dairy Breeds and Their Competitive Advanced Registry Standing by Sending to us for a Free Copy of "Dairy Breed Comparisons No. 7."

This instructive, illustrated 24-page pamphlet contains illustrations of high record Holsteins, Guernseys, Jerseys, and Ayrshires, also the five highest 7-day Holstein records; a synopsis of yearly records from 600 to over 1,100 lbs. fat; the leading cows of each breed for yearly production in seven classes; the ten highest record cows of each breed; the average yearly breed production from a summary of 2,387 Holstein, 4,086 Guernsey, 4,297 Jersey, 1,752 Ayrshire, and 121 Brown Swiss records. Just drop a postal card.



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**Is the Best Form of Lime
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If You Want
**QUANTITY
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QUICK SERVICE**

And a Finely Pulverized
Material,

BESSEMER
Pulverized Limestone
Has No Superior.

**BESSEMER
LIMESTONE CO.**

**714 Stambaugh Bldg.
Youngstown, O.**

All lambs should be docked, ewe lambs when they are from eight to fourteen days old, and ram lambs from five to seven days after castration. The main purpose of docking is to get rid of the dirt which collects on the tail. Uniformity in docking should be watched as this makes a bunch of lambs much more attractive. There are various ways of docking. Some use a chisel and a mallet, others use a sharp knife. The use of the hot docking pincers is quite popular now, since no loss of blood will result from their use. The tail should be cut off about two inches from the body.

A lamb should be weaned at the age of four and a half or five months old. Weaning themselves is not a good practice. The ewes need some rest and a time to regain their vitality lost in suckling the lamb. Take the lambs away from the ewes and put them on some fresh pasture. Do not allow them to get back to their mothers again. Good pasture is essential to make up for the loss of the mother's milk.

Goitre sometimes causes the death of many lambs. This is attributed to the feeding of too concentrated feed to the pregnant ewe. Too much succulent food may cause same result. Keeping ewes in closely cramped quarters, and not allowing enough exercise will cause goitre. Painting two or three times daily with iodine will remove the goitre if it is not too large.

Of all times in the history of the sheep industry, conditions at the present time with the present prices and the present need for meats and wool, behoove shepherds to carefully attend their flocks.

EIGHT WEEK CLASS GRADUATES

Commencement exercises for the students finishing the eight weeks' agricultural course were held in the auditorium

of the Home Economics Building at 9 a. m., Friday, Feb. 28. The class was composed of seventy-five students, two members of which were girls. The program was as follows:

Music.....University String Sextet
 Invocation.....Rev. Howard M. LeSourd
 Music.....University String Sextet
 Class addressPresident Thompson
 Music.....University String Sextet
 Presentation of certificates, Alfred Vivian, dean; T. G. Watson, secretary.
 Music, "Carmen Ohio."
Sextet and Audience

In his class address, President Thompson discussed the subject of "True Happiness." He spoke of the fundamentals of happiness and also of its limitations. "Selections of the best practices correct the judgment between the true and the false, and even the poorest may select the best," said Dr. Thompson. Continuing, he said: "Underneath human happiness lies the tone of desire and we must realize that wealth and outward appearances do not always constitute true happiness."

Dean Vivian, in his talk after the presentation of certificates, said: "The measure of judging success is not by the amount of money you are able to make. The only money you can take to heaven with you is that which you use here on earth for the benefit of others. Your success will depend upon whether your home has become a little better by your having lived in it; if your community has progressed any because you have been a citizen of that community; and if your schools and churches are better because of your interest and work in them."

Quickest Development Greatest Gains



Purina Pig Chow is a highly nutritious food that secures rapid development and greatest gain because it's a scientific balance of concentrates that build an abundance of bone, and put on fat and flesh simultaneously.

For this reason feeders everywhere are reporting to us high average weights attained in record time by feeding Purina Pig Chow.

Purina Pig Chow

is made only from corn, digester tankage, cane molasses and alfalfa flour, with a trace of charcoal and salt. All pure ingredients—no screenings or cheap by-products used.

Ask for our 48-page booklet, *The Purina Weigh*, fully illustrated. It will be sent on request. Our Research Department will be glad to furnish you with further information regarding this scientific fattening feed and quick developer.

PURINA MILLS,
 Ralston Purina Co., Prop.
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**Highest Winning Butter Is
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The Rich Golden June Color

—BY—

CHR. HANSEN'S DANISH BUTTER COLOR

The Color that does not affect the Finest Flavor or Aroma of first-class butter.

Chr. Hansen's Laboratory, Inc., are also headquarters for: Rennet extract and Pepsin substitutes for same, Rennet Tablets and Cheese Color Tablets, Liquid Cheese Color, Lactic Ferment Culture, etc.

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SCOTT'S SWEET CLOVER

SURE AND PURE

Hulled and scarified white clover is about ten dollar per bushel cheaper than red. (Unhulled cheaper yet.) As it is a biennial, taking the place of red in the rotation and any amount better as a land builder, it is an economical substitute. Winter sowing is the best. Ask for samples and prices as well as our catalogue telling "**How to Know Good Seed.**" All other kinds of field seeds too.

O. M. Scott & Sons Co.

169 Sixth St.

Marysville, Ohio.

ORCHARD AND GARDEN NOTES

The small, well pruned and well sprayed home orchard is worth more to the farm than the large one uncared for. Cut out the trees you can not take care of.

Most house plants root readily in a glass of water if kept in an even temperature and not in direct sunlight.

See that the fruit trees are pruned and in good condition for next season. Cut out the poor ones and take care of the others.

Don't throw away the bulbs when they are through blooming. Keep them and set them in the garden as soon as the ground thaws.

Plan for a large, well-cared-for vegetable garden this year. Add a good quantity of flowers to it. Both vegetables and flowers will be needed more than ever this year.

Spray machinery should be put in order now and spraying machinery purchased.

Order seed now. Stocks are not picked over or depleted. You can also have time to test the seed before planting.

Hotbeds may be started now. See that they are well protected on the outside with dry straw or dry manure. Heating or wet manure freezes and takes heat from the beds.

Save all wood ashes till next summer. They will come in handy for garden and fruit crops.

CONTROL FIRE BLIGHT BY CAREFUL PRUNING

"Watch for fire blight." This is the warning given by specialists of the Ohio Experiment Station to orchard men of the state as they begin to do their winter and spring pruning. Fire blight causes apple twigs to die away quickly and is the same organism that causes the blight on pear trees but it is much

more severe on pear than on apple trees.

The disease has been found to live through the winter in cankers on the larger limbs or on the diseased twigs. If these are removed by the orchardist the dangerous source of infection will be removed, although methods of control must be used frequently to prevent the spread of the blight.

What appears to make the disease difficult to control is that each wound made by pruning must be disinfected; but by using a solution of mercuric chloride, one to one thousand parts of water, this can be accomplished. Orchardists in pruning trees affected with blight, however, tie a small sponge saturated with the solution to their pruning tool and daub each cut.

COUNTY WINNERS IN TEN ACRE CORN CONTEST FOR 1918

Paul Harrod, Auglaize County-----	80.16
W. H. Baker, Champaign County-----	66.56
Clyde C. Cox, Clermont County-----	75.66
Carl F. Dohse, Darke County-----	59.16
Frank W. Ruggles, Huron County-----	73.87
Orville Yarger, Highland County-----	68.85
M. Virgil Smith, Lawrence County-----	71.33
D. C. Kleetner, Licking County-----	52.20
Alonzo Berkebile, Lucas County-----	72.91
J. H. Smeltzer, Marion County-----	56.17
E. M. Wissinger, Miami County-----	67.94
W. H. Prugh, Montgomery County-----	56.90
Guy Imler, Van Wert County-----	82.23
H. O. Rosendale, Wood County-----	64.53
Victor L. Bushong, Clark County-----	67.22

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General Hardware and Sheet
Metal — Manufacturers of
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Apparatus.

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Top Dress with Nitrate of Soda

It does not Sour the Soil

Nitrate of Soda leaves no mineral acid residue behind to injure your soil. It makes bigger crops—and keeps the land sweet.

Nitrate of Soda

Top dress 100 lbs. per acre for seeded crops; 200 lbs. cultivated in thoroughly for cultivated crops. These light dressings, evenly spread over an acre, will work for your profit.

WM. S. MYERS

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Anticipating the Holiday Season which is just around the corner, we're showing many interesting, attractive and useful things especially designed for gift purposes.

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At prices that are sufficiently varied to meet every one's requirements.

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Every Monday and Wednesday Evenings at 9:30

Come! Learn the Fascinating Dances

WEEKLY CALENDAR

Advanced Class—Mondays and Wednesdays—7:30

Beginners' Class—Tuesdays and Thursdays—7:30.

Assembly—Fridays and Saturdays—8:15.

Emerson's Six-Piece Orchestra.

Advanced Class—Monday, 3:00.

Beginners' Class—Friday, 3:00.

Juvenile Class—Saturday, 2:00.

Private Lessons by appointment.

As the above calendar will be followed during the entire season all interested in dancing should cut out this page and reserve it for future reference.

For information pertaining to classes or assembly, call the phones given below and all questions will be cheerfully answered.

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February Dancing Calendar

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Take Neil Ave. car and get off at Poplar Ave.

Beginners' Class—Friday evening, March 14., 7:30.

Afternoon Class—Thursday afternoon.

Reception Night—Monday evening.

Reception Night—Thursday evening.

Reception Night—Saturday evening (large hall).

Private Lessons—Afternoon or evening.

Juvenile Class—Saturday afternoon, 2 o'clock.

Music by Heber Bros.' Orchestra.

Tuition: Gentlemen, per term of ten lessons, \$5; Ladies, \$4; private lessons, \$1, six for \$5. Tuition can be paid \$1 per week until paid. Learn in one term.

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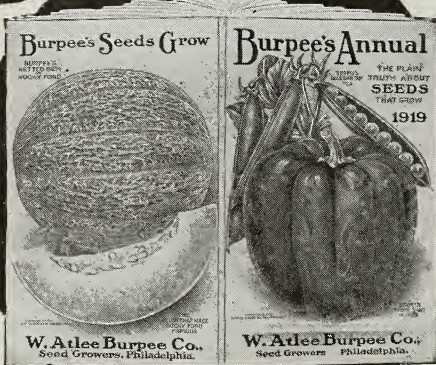
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is a complete guide for the Flower and Vegetable garden. It contains an entire chapter on *Edible Seeds, Root Crops and Greens and Salads*, and last—but most delicious of all—*Vegetable Fruits*. **Burpee's Annual** is considered the Leading American Seed Catalog. It will be mailed to you free upon request. Write for your copy today, a post card will do.

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Shenango *Pulverized Limestone*

applied to your clover or alfalfa crop will swing it past the danger point. It will not only insure a good crop of clover or alfalfa but it will increase the yield of succeeding crops.

A ton or two of Shenango Pulverized Limestone to the acre means increased crops and better farming.



Write us for samples, prices and information.

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DE LAVAL
CREAM SEPARATOR

If you have any use for a cream separator, it's only a question of time before you buy a De Laval.

Many buy a De Laval to start with and so avoid a lot of "separator grief."

Others buy one, two or three different machines before they finally learn by experience that "the best is the cheapest" and get a De Laval.

That's why, in the older dairy sections where separators have been in general use for many years, you'll find most of the machines are De Lavals.

"Claims" don't mean much to such farmers. They've had lots of separator experience. "Performance" means a thousand times more to them than claims.

They've watched the De Laval "perform" for several decades. They know that it is reliable and they stick to it, just as does the creameryman who is also "separator wise."

Why not be guided by the experience of these men and buy your De Laval "Sooner" instead of "Later?"



Order your De Laval now and let it begin saving cream for you right away. See the local De Laval agent, or, if you don't know him, write to the nearest De Laval office as below

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